AWOS 3000

Automated Weather Observing System

AWOS III P/T/Z
Site Preparation Manual

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☐	**NOT FAA APPROVED**

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Rev. A

allweatherinc

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Latest Manual Version
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Chapter 1

General

1.1 Introduction

This manual is designed to assist a contractor retained to prepare a site for an Automated Weather Observing System (AWOS). Site preparation includes not only the actual physical work, but permits, licenses, and coordination with airport authorities. This document provides details for concrete, towers, conduit and underground lightning protection.

The actual installation of sensors and equipment described in the ***AWOS 3000 Installation and Checkout Manual*** (3000-017) will be performed by or under the direction of All Weather, Inc.

There are several different AWOS 3000 systems that differ in the sensors that are installed. There is a Site Preparation Manual is specific to each AWOS 3000 system category, so you will need to refer to the correct Site Preparation manual for the system category you are installing. The different AWOS system categories are listed below.

AWOS SYSTEM CATEGORIES							
AWOS A	AWOS I	AWOS II AWOS A-V	AWOS III AWOS III P	AWOS III T AWOS III P/T	AWOS III P/T/Z	PLATFORM	ELEVATED

All drawing references refer to the drawings at the back of this manual. Each drawing sheet is labeled with a text caption. These captions will be used within this document to identify the relevant sheet(s).

1.2 Definitions

As used herein, the term contractor refers to the site preparation contractor who has been assigned responsibility for all site survey and preparation tasks.

The term manufacturer refers to All Weather Inc., who will provide and install the AWOS hardware.

1.3 Steps Before Site Preparation Begins

A site survey is highly recommended before a site is selected. In particular, the site needs to accommodate the needs of the following sensors.

- Model 2020 Vane and Model 2030 Anemometer — Large obstructions within 300 m of the sensor dictate the minimum height for the sensor. Refer to the ***Model 2020 Micro Response Vane User's Manual*** and to the ***Model 2030 Micro Response Anemometer User's Manual*** for more information.
- Model 2040 Ultrasonic Wind Sensor — Large obstructions within 300 m of the sensor dictate the minimum height for the sensor. Avoid locations that may be in the plane of a radar scanner, and do not place this sensor in the line of sight to a satellite radio transmitting antenna. The sensor should be at least 1 m away from VHF transmitters. Refer to the ***Model 2040 Ultrasonic Wind Sensor User's Manual*** for more information.
- Model 8364-E Visibility Sensor — Locate the sensor as far as practical from strobe lights and other modulated light sources. Do not locate it in an area that is subject to localized obstructions to vision (e.g., smoke, dust, etc.). At the same time, it should not be so isolated that it cannot detect more widespread obstructions when they affect visibility in the area of concern. Refer to the ***Model 8364-E Forward Scatter Visibility Sensor User's Manual*** for more information.
- Model 6490 Present Weather Sensor — In general, the sensor should be located on level or slightly sloping ground where the sensor site will be exposed to the same environment as the area around it. Ideally, the area around the site should be free of buildings, trees, and other obstructions. Refer to the ***Model 6490 Present Weather Sensor User's Manual*** for more information.
- Model 6495 Freezing Rain Sensor — The Freezing Rain Sensor comes pre-installed on a flat mounting plate, which in turn attaches to a standard 2 ½" pipe using U-bolts. Refer to the ***Model 6495 Freezing Rain Sensor User's Manual*** for more information.
- Model 6500 Thunderstorm/Lightning Detector — The antenna is sensitive to static charges, so care must be taken to ensure that the antenna and ground plane are as far removed as possible from composite materials (e.g., plastic materials or fiberglass), since these materials have a tendency to build up static charge. The sensor should be mounted as far as possible from devices that emit high levels of radio frequency interference (RFI) and electromagnetic interference (EMI), such as VHF and UHF radios, RF modems, fluorescent lamps, and ballasts, air conditioner and heater blowers, as well as any current-carrying cables. Refer to the ***Model 6500 Thunderstorm/Lightning Detector User's Manual*** for more information.

The proposed locations of the tower and sensors also take into account the requirements of FCM-S4, ***Federal Standard for Siting Meteorological Sensors at Airports***, and ICAO Annex 14, ***Aerodromes***, so that the tower and sensor locations conform to operational, regulatory, and safety requirements. Some guidelines for locating sensors are included in the User's Manuals for the individual sensors, where appropriate, but these are only technical guidelines for the individual sensors and do not take into consideration the broader guidelines for a complete system.

Send FAA Form 7460-1, ***Notice of Proposed Construction or Alteration***, to the FAA Air Traffic regional office located in the area you plan to build the tower at least

- 30 days prior to the date you propose to begin construction, or
- 30 days before you plan to file an application for a construction permit,

whichever is earlier.

Site preparation activities may not commence until a ***Notice to Proceed*** is received and all permits and licenses required by local authorities for the work have been procured.

1.4 Requirements

Site preparation consists of all functional responsibilities from coordination with airport authorities to the installation of the wind tower, foundations, conduits, and other physical preparations for the AWOS.

NOTE: NATIONAL AND LOCAL CODES SHALL HAVE PRECEDENCE OVER ANY INSTRUCTION OR DETAIL IN THIS DOCUMENT.

1.5 Coordination with Airport Authorities

The Airport will furnish the contractor with information relative to the facility. As available, this information will include equipment layout drawings, aerial photographs, coverage charts, obstruction plots, contour maps, existing termination points for commercial power and communications systems, and plot plans delineating proposed construction. Specific manufacturer's data is included in this document.

Coordination with airport authorities will address locations of power and communication termination for the remote site as well as the central site. Coordination with airport authorities should also include site access procedures and site contact information for use during site preparation and system installation.

Chapter 2

Site Preparation

Once a ***Notice to Proceed*** is received and all permits and licenses required by local authorities for the work have been procured, the contractor shall perform the following site preparation work.

1. Perform clearing, grading, excavation, filling and backfilling.
2. Provide all concrete work (tower base, sensor foundation pads, etc.)
3. Install the 30' tower with obstruction lights and lightning rod.
4. If applicable, provide and install a data cable from the 30' tower to the central data processing computer.
5. Provide and install an underground power run to the AWOS sensor site, terminating in (as required) junction box(es), disconnect box, transformer, duplex outlet, and a circuit breaker panel next to the tower.
6. Provide and install all below grade grounding for lightning protection for the AWOS system.
7. Provide and install the conduits between the 30' tower and junction boxes at the sensor foundations. Refer to the ***Site Layout, Trenching and Grounding*** and ***Electrical Conduit*** drawings.
8. Install and energize the tower lights (see the ***Tower Lighting Installation*** drawings).
9. Provide and install antenna masts.

The tower, obstructions lights, lightning rod, VHF radio mast, and optional tower-mounted UHF radio masts are either provided by All Weather, Inc. or are procured by the airport authority. All other materials required to perform the site preparation instructions listed are provided by the site preparation contractor. The Material List in Chapter 8 describes the materials required to do the site preparation work.

Chapter 3

Elevation and Wind Direction Benchmarks

A surveyor should be retained to locate the North benchmark.

A wind direction reference point must be established in one of the four cardinal directions to align the wind direction sensor. It is simplest to use True North as the reference, though at some installations this may not be feasible. The reference point should be established relative to the center of the AWOS tower. The following instructions explain how to locate a North benchmark. Any of the other three directions can be determined once True North has been established.

True North uses the earth's geographic meridians, while Magnetic North is the North indicated by a magnetic compass. Depending on a site's location, Magnetic North is to either the East or West of True North (with the exception of sites along the "line of zero declination", where Magnetic and True North are the same). This difference, measured in degrees, between True North and Magnetic North is known as the **magnetic declination**. For sites west of the line of zero declination (which runs roughly from west of Hudson Bay, down along Lake Michigan to the Gulf Coast in western Florida), the magnetic declination is "Easterly". For sites east of the zero line, the declination is "Westerly". The magnetic declination for a particular site can be obtained from the site survey data form, airport directory, or from a U.S. Geological Survey map.

Use a surveying compass with telescope that can provide a measurement accurate to within 1° to determine True North at the installation site.

Once True North has been established, use the surveying compass to determine the location at which the benchmark will be installed. Install the benchmark approximately 100 feet from the tower, and note the location in the log book.

The benchmark must be suitably protected from being buried, cut down, or destroyed during normal maintenance of the area.

In addition to determining a wind direction benchmark, the barometric pressure sensor site elevation needs to be determined so that it can be factored into the altimeter calculations. The contractor doing the site preparation work does not have to do this directly since the information may be determined from the site survey data form, airport directory, or from a U.S. Geological Survey map.

Chapter 4

Hardware Installation

The hardware installation includes the construction of all foundations, placement of conduit, erection of the tower, connection of the AC power distribution system, tower lights, and lightning rod, and, for radio data link installations, installation of the antenna mast and antenna.

4.1 Foundations

Foundations described in this section apply to installations in the Continental U.S. where the frost depth does not exceed 36 inches. Increase foundation depth accordingly where frost depths may exceed 36 inches.

Two towers are available for use in AWOS installations, the Model 8509 Stacked Tower and the Model 8518-A Foldover Tower. Where the drawing details are unique to a particular tower, the tower type is identified on the drawing sheet.

4.1.1 Thirty-Foot Tower

Refer to the ***Tower Foundation*** drawing for tower foundation construction details.

Construct a 2×4 frame for the portion of the pad above ground surface. Locate foundation bolts in the 2×4 frame as specified in the drawings for later use to secure a mounting frame for the junction boxes, etc. The bottom of the hole should have a six-inch indentation that is filled with compacted sand and gravel for drainage of the tower legs.

When all forms and wire mesh are installed and the tower base is in place (*note: install the tower base with the mounting holes up*), pour the concrete, making sure that the tower is vertical to ±2 degrees. The concrete should be crowned slightly to allow water to runoff. When the concrete has set, remove the 2×4 forms and backfill as required. Bevel all pad edges.

4.1.2 Visibility Sensor Pad

The Model 8364-E Visibility Sensor mounts on a 2½" galvanized steel pipe (2.875 O.D.) that extends about 8 feet above ground level. The bottom section of the two-piece mast is embedded in the concrete for ease of installation. Refer to the ***Visibility Sensor Foundation*** drawing for construction details. Make sure the mast is vertical to within ± 2 degrees. Bevel all pad edges.

All concrete pads should be crowned to keep rain from accumulating around the vertical pipe. Also, it might be a good idea to cap this pipe temporarily if there will be much time between site preparation and installation of the visibility sensor to keep rain from accumulating in the pipe.

4.1.3 Ceilometer Pad

The Model 8339 Ceilometer mounts on a 2½" galvanized steel pipe (2.875 O.D.) that extends about 6 feet above ground level. The bottom section of the two-piece mast is embedded in the concrete for ease of installation. Refer to the ***8339 Ceilometer Foundation*** drawing for construction details. Make sure the mast is vertical to within ± 2 degrees. Bevel all pad edges.

All concrete pads should be crowned to keep rain from accumulating around the vertical pipe. Also, it might be a good idea to cap this pipe temporarily if there will be much time between site preparation and installation of the ceilometer to keep rain from accumulating in the pipe.

4.1.4 Lightning/Thunderstorm Sensor Pad

The Model 6500 Lightning/Thunderstorm Sensor mounts on a 2½" galvanized steel pipe (2.875 O.D.) that extends about 5 feet above ground level. The mast consists of one base pipe that extends a few inches from the concrete base. The mounting pipe is attached to the base pipe via a coupling fitting. Refer to the ***Lightning Sensor Foundation*** drawing for construction details. Make sure the mast is vertical to within ± 2 degrees. Bevel all pad edges.

All concrete pads should be crowned to keep rain from accumulating around the vertical pipe. Also, it might be a good idea to cap this pipe temporarily if there will be much time between site preparation and installation of the lightning/thunderstorm sensor to keep rain from accumulating in the pipe.

4.1.5 Freezing Rain Sensor Pad

The Model 6495 Freezing Rain Sensor mounts on a 2½" galvanized steel pipe (2.875 O.D.) that extends about 8 feet above ground level. The mast consists of one base pipe that extends a few inches from the concrete base. The 6' mounting pipe is attached to the base pipe via a coupling fitting. Refer to the ***Freezing Rain Sensor Foundation*** drawing for construction details. Make sure the mast is vertical to within ± 2 degrees. Bevel all pad edges.

All concrete pads should be crowned to keep rain from accumulating around the vertical pipe. Also, it might be a good idea to cap this pipe temporarily if there will be much time between site preparation and installation of the freezing rain sensor to keep rain from accumulating in the pipe.

4.2 Conduit, Trenching, and Lightning Protection

All sensor locations will require signal, power, and lightning protection cables. The conduit, trenching, and lightning protection details are specified in the drawings.

After the foundations are poured, excavate a trench from the incoming power source (and land line communications cable, if applicable) to the 30' tower and from there to each of the foundation pads. Refer to the ***Site Layout, Trenching and Grounding*** drawings for trenching details. All conduits and lightning protection cables will be installed in this trench. Install the 3/4" x 10' L ground rod. To this ground rod, weld or clamp a #4/0 AWG ground wire for each foundation pad, and any other ground wires that may be necessary. Route a cable to each pad in the most direct method. Do not bend any of the ground cables in less than an 8" radius at any point in the cable length, and do not bend any cable to an angle sharper that 90°. Connect each cable to the point on the pad shown in the individual ***Sensor Foundation*** drawings using an M105656-00 lug. The lug is attached to the tower leg on either tower according to the ***Tower Installation*** drawing. Before attaching the lug, remove paint by scraping or sanding to ensure a good electrical connection, as the tower itself will function as a lightning down conductor. Another cable is attached by an M105656-00 lug to a bolt on the mast on the visibility pad. A lug is to be left attached to the cable that comes out of the ground at the ceilometer pad, with the cable length such as to reach the approximate center of the pad. The All Weather, Inc. engineer will connect this when installing the sensors.

Note that all buried ground connections are to be exothermically welded to comply with Advisory Circular 150/5220-16C, Section 34, with respect to lightning and surge protection.

Install the power cables and conduit that supply power to the site to the equipment mounted on the frame at the tower location (see Section 4.3). The frame details are defined in the drawings. Place power conduits in the trench, and attach junction boxes or 90° condulets at the sensor foundations. The ends at the tower connect to the circuit breaker cabinet. The junction boxes or condulets at the sensor pads are supported by rigid conduit and straps attached to the foundation. Install the signal conduits in the same manner, securing the ends at the tower to a junction box on the frame. If applicable (land line sites), install the incoming communications conduit and cable from the central data processing computer to a junction box next to the tower (see Section 4.3.2).

Place electrical wire of an appropriate size and type in the electrical conduits running from the circuit breaker panel to junction boxes at the sensor pads.

Place 3/16" pull ropes in all signal conduits running between the tower and the sensor pads.

Backfill and compact the trench.

4.3 Utility Services

4.3.1 Input Power

The contractor shall provide and install the required AC input power (see the ***Power Requirements*** drawing) for use by the AWOS, connecting to an existing power source as determined during the site survey.

Transformers, main disconnect boxes etc., if required, shall be provided in accordance with ANSI-C57, 12.25-1981.

4.3.2 Communications

At airports designated as “land line” (as opposed to UHF/VHF radio data link), provide and install a communications data cable as specified in the materials list from a junction box next to the tower to the AWOS central data processing computer. The maximum length is 4,000 feet. The cable should be either in a conduit for its full length, or of a type suitable for direct burial.

4.4 Tower Installation

Do not install towers near power lines. All towers should be installed by experienced and trained personnel. All installations must be grounded per local and national codes. For sites with the Model 8518-A Foldover Tower, care should be taken to site the tower so that the tower and boom are clear of obstructions when folded over. See the ***30' Foldover Tower Installation*** drawing for clearance measurements.

The use of a climbing belt is mandatory for any person climbing the stacked tower.

Installation of the tower assumes completion of the foundation. The foundation concrete must be adequately cured before tower installation. See the ***Tower Installation*** drawings for installation details.

4.4.1 Tower Lights

The tower lights must be installed immediately after erection of the tower. Refer to the ***Tower Lighting Installation*** drawing for details.

4.4.2 Lightning Protection

Remove paint from the area under the lightning rod clamps, and install the lightning rod according to the ***Tower Installation*** drawing.

4.4.3 UHF/VHF Data Link Antenna Mast (Data Link Installations Only)

(See the ***Radio Data Link Antenna Mast*** drawing). Bend a piece of ¾" conduit (rigid or EMT) as shown on the drawing. Locate the antenna mast on the side of the tower nearest the Central Station Equipment. No obstructions may exist between the antenna on the tower and the antenna located near the Central Station Equipment. A clear line-of-sight path is required. Use the M488292-00 antenna mount to attach the antenna to the mast instead of the bracket provided with the antenna.

The All Weather, Inc. engineer will install the antenna and the antenna cable.

4.5 Central Data Platform (CDP)

Place the CDP at an indoor location specified by the airport authority. The indoor space must accommodate the 11RU equipment rack, which is 22" × 20.5" × 20", and weights about 150 pounds, including the UPS power supply. The location should take into account the need to access the front and both sides of the rack.

4.5.1 Equipment

The CDP is mounted in an industrial-grade 11RU rack along with a UPS. The rack also houses the VHF ground-to-air radio and the CDP options.

4.5.2 Temperature Requirements

The indoor equipment must be located in a conditioned space where the temperature is maintained between 40°F and 105°F, with a relative humidity between 5% and 90%.

4.5.3 Power Requirements

The indoor equipment must be located within three feet of an outlet with 120 V AC, 60 Hz (± 5%). The indoor equipment requires 500 V·A and should be on a dedicated 15 A circuit.

4.5.4 Telephone Requirements

The indoor equipment must be located with access to a telephone line terminated with an RJ-11 connector. The phone line is dedicated to the AWOS modem and must not be shared with other telephones, FAX machines, etc.

4.5.5 VHF Voice Radio Antenna Mast

The VHF radio antenna (supplied and installed by All Weather, Inc.) will be located outdoors and away from obstructions. The antenna should not be mounted within 100' of other radio transmitters, such as a UNICOM transmitter. If such a location is not available for the radio mast, contact All Weather Inc. for further instructions. This antenna is usually mounted on the roof of a building; however other mounting configurations are available (see the ***Central Station Antenna Mast Options*** drawing). The mast should be at least 5' in length. Install the desired antenna mount and mast.

The VHF radio antenna and cable will be installed by the All Weather Inc. engineer.

4.5.6 UHF/VHF Data Link Radio Antenna Mast (Data Link Installations Only)

The UHF/VHF Data Link Radio Antenna (supplied by All Weather Inc.) must be located outdoors and away from obstructions. This antenna is usually mounted on the roof of a building; however other mounting configurations are available (see the ***Central Station Antenna Mast Options*** drawing). The antenna mast should be at least 5' in length. This antenna should be mounted at least 20' away from the VHF Voice Radio Antenna. Install the desired antenna mount and mast.

The All Weather, Inc. engineer will install the antenna and antenna cable.

4.5.7 AWOS Net (optional)

Some AWOS systems use the optional AWOS Net. The AWOS Net can be used as a Web server and/or to support a remote display. There are three types of AWOS Net, each based on the communication protocol used by the AWOS Net.

4.5.7.1 RS-232 AWOS Net

No additional site preparation work is needed for this AWOS Net type.

4.5.7.2 RS-485 AWOS Net

No additional site preparation work is needed for this AWOS Net type.

4.5.7.3 UHF Radio AWOS Net

The UHF radio AWOS Net is used when the AWOS Net cannot be hard-wired to the CDP or is more than 4000 feet from the CDP. The CDP must be communicating with the DCP using a UHF radio for this AWOS Net option to be used.

An antenna mount like the VHF antenna mount described in Section 4.5.5 must be installed on the roof of the building or some other appropriate location within the line of sight to the CDP UHF radio antenna. The AWOS Net device uses the same frequency as the DCP–CDP UHF radio link

Install the antenna mount and mast (see the ***Central Station Antenna Mast Options*** drawing). The mast should be at least 5' in length.

The UHF radio antenna and cable will be installed by the All Weather Inc. engineer.

Chapter 5

Site Cleanup and Restoration

Site cleanup and restoration shall include the following:

1. Removal of all contractor-furnished material, tools and equipment that will not become airport property upon acceptance of site work.

2. Removal of all trash, litter, packing, and excess material from the site, to be disposed of by the contractor.

3. Restoration of previously existing access roads, parking areas, building exterior or other portions of the site inadvertently damaged by the contractor so as to be returned to the same condition as existed before beginning work at the site.

4. Optionally, fill site with gravel or crushed rock for drainage and control of vegetation.

5. Upon completion of the site cleanup and restoration, the contractor shall obtain a written release from the property owner attesting that the sites have been restored to a satisfactory condition.

Chapter 6

Tests and Inspections

The contractor is responsible for securing all necessary construction and electrical permits, waivers, etc., before commencing work. After completion of the work, the contractor shall demonstrate acceptable work to the airport owner, manager, or other authority as appropriate. It is the responsibility of the contractor that all aspects of this project that are under his control are in conformance with appropriate building and electrical codes. Nothing in this document shall preclude any requirement for code conformance.

As early as possible, the contractor shall notify All Weather Inc. of the date when the site will be ready for installation of the AWOS system. The contractor is required to provide digital photographs showing that all required work has been completed and that the equipment is at the site. All Weather, Inc. will not schedule an FSE (Field Service Engineer) for installation until these photographs have been submitted and reviewed to ensure the site is ready for installation. The contractor may also be required to provide a signed document attesting that all required work has been completed and that all equipment and material have been installed in accordance with the appropriate manuals and specifications, applicable building codes, and accepted engineering practices; that the tower lights are operational; that circuit breakers are available in the disconnect box; that pull ropes are in the signal conduits; that all towers and pads are leveled properly; and that the communication line to the central station is in place.

To assure that the site is completely ready for delivery and installation of AWOS equipment, the airport may invite the AWOS equipment vendor to participate in the acceptance inspection. The contractor shall correct all deficiencies detected during the inspection prior to the airport acceptance of site work. Facilities that give evidence of substandard contractor performance will not be accepted by the airport.

When All Weather Inc. is notified of completion as described above, if any part of the site preparation described in this document has not been accomplished and extra costs are incurred as a result of such deficiency, the contractor may be required to reimburse All Weather Inc. for such actual excess costs.

Chapter 7

Coordination

The contractor shall perform all work in a manner that does not conflict with or adversely affect the air traffic operational environment. In the event of any actual or potential conflict, air traffic activities shall have priority over all contractor activities. The contractor shall provide services in a manner and at such times as will not disrupt the normal flow of air traffic.

Chapter 8

Materials List

All Weather Inc. shall supply the tower and the tower light fixture. The site preparation contractor shall provide the remaining materials as listed in the ***Material List*** in drawing 3000-Z-007.

Chapter 9

Antenna Mounting Materials List

The following table lists the material requirements for antennas installed as part of the Central Station equipment.

All sites require one antenna at the Central Station for VHF radio voice output. Sites using UHF data links require two antennas at the Central Station, along with mounting hardware and masts. Select one mounting option from the table for each antenna. Figures showing antenna assembly procedures and the various mounting options are included at the back of the ***Drawings*** section of this manual.

Antennas and Antenna Mounting Materials List		
Quantity	Description	Part No. (or equiv.)
1* or 2** or more*** * (voice only) ** (voice and data link) ***(one more for each UHF Radio AWOS Net)	Antenna mast, 1-1/4" x 5' or 1-1/4" x 10'	Radio Shack 15-842 (5') Radio Shack 15-843 (10') GC Electronics 32-9013 (5') GC Electronics 32-9014 (10')
Select 1 mounting option for each antenna	Base and roof mount	Radio Shack 15-889
	Vent pipe mount	Radio Shack 15-893 GC Electronics 8802
	"12"" wall mounts"	Radio Shack 15-885 GC Electronics 8312
	"4"" wall mounts"	Radio Shack 15-883 GC Electronics 8304
	Eaves mount	Radio Shack 15-891
	3' tripod mount	Radio Shack 15-516 GC Electronics 9160

Antenna and antenna cables supplied by All Weather Inc.

Chapter 10

Drawings

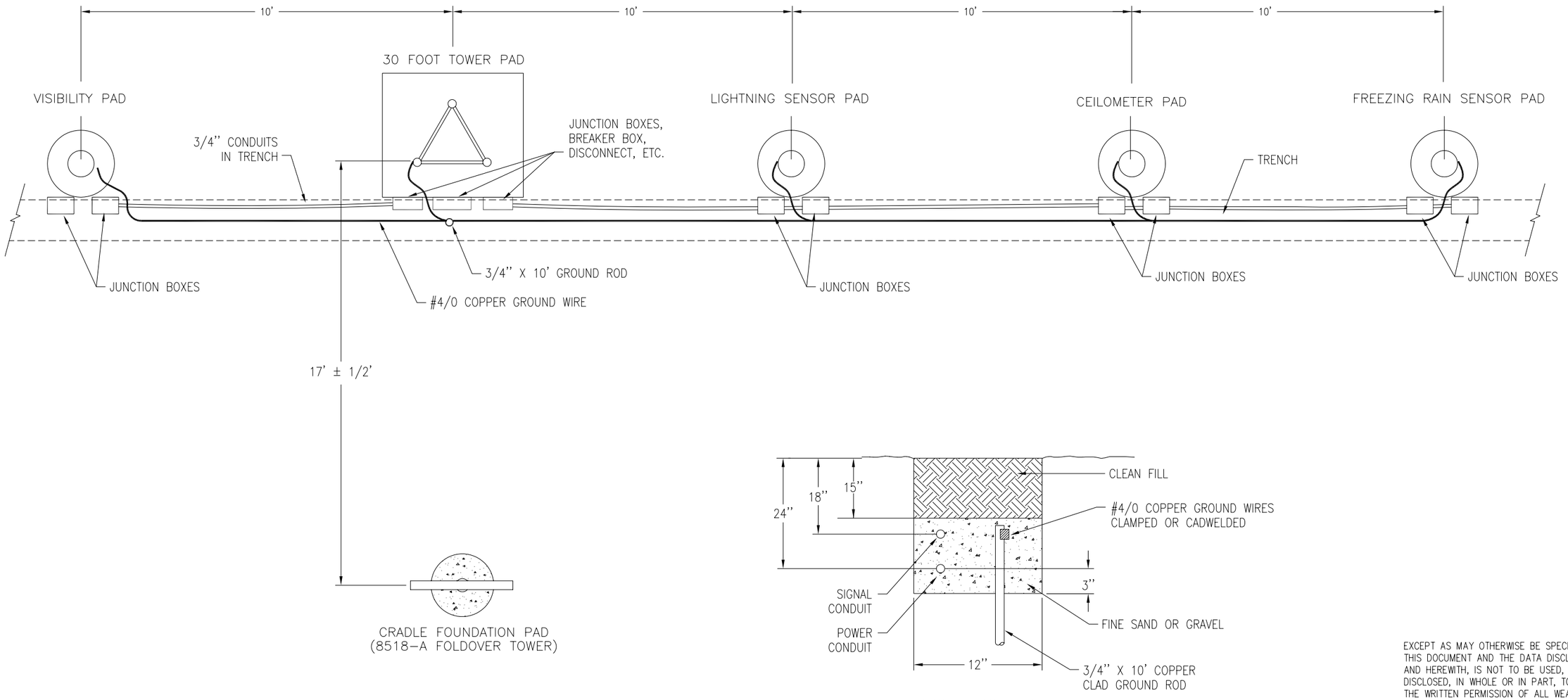
The following pages contain drawings detailing site preparation activities.

3000-Z-007	Site Layout, Trenching, and Grounding
—	UHF/VHF Antenna Assembly

REVISIONS			DWG NO. 3000-Z-007	
REV	ECO	DESCRIPTION	DATE	APPROVED
A	1535	INITIAL RELEASE	11-18-09	JPATTERSON

NOTES: UNLESS OTHERWISE SPECIFIED;

1. DO NOT BEND GROUNDING CABLE TO LESS THAN 8'' RADIUS.



CRADLE FOUNDATION PAD
(8518-A FOLDOVER TOWER)

TYPICAL TRENCH DETAIL

EXCEPT AS MAY OTHERWISE BE SPECIFIED BY CONTRACT, THIS DOCUMENT AND THE DATA DISCLOSED HEREIN AND HEREWITH, IS NOT TO BE USED, REPRODUCED OR DISCLOSED, IN WHOLE OR IN PART, TO ANYONE WITHOUT THE WRITTEN PERMISSION OF ALL WEATHER INC.

REV	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
SHEET	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

REV STATUS OF SHEETS

TOWER PAD, VISIBILITY SENSOR PAD, CEILOMETER PAD, LIGHTNING SENSOR PAD AND FREEZING RAIN SENSOR PAD SITE LAYOUT, TRENCHING AND GROUNDING

APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT:	

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
XX=±.010 ANGLES ±1/2'
XXX=±.005 CONCENTRICITY: .003 TIR
DO NOT SCALE DRAWING

MATL: SEE MATERIAL LIST

FINISH: N/A

TREATMENT

DRAWN BY: J PATTERSON	11-18-09	
REVISED BY:		
CHECKED BY:		
DESIGN ENGINEER: J PATTERSON	11-18-09	
PROJECT MANAGER:		
APPROVALS	DATE	

TITLE: AWOS SITE PREPARATION DOCUMENT FOR SITE LAYOUT, TRENCHING AND GROUNDING

allweatherinc

SIZE D | DWG NO. 3000-Z-007

SCALE NONE | RELEASE DATE 11-18-09 | SHEET 1 OF 17

115VAC 60Hz 1PH

SENSOR SITE		
LOCATION	LOAD	BREAKER SIZE
OBSTRUCTION LIGHTS (TOWER)	400 VA MAX.	15A
DATA COLLECTION PLATFORM, DAY/NIGHT DETECTOR (TOWER)	500 VA MAX.	15A
RAIN GAUGE (TOWER)	200 VA MAX.	15A
PRESENT WEATHER SENSOR (TOWER)	200 VA MAX.	15A
DUPLEX OUTLET (TOWER)	500 VA MAX	15A
VISIBILITY SENSOR	400 VA MAX.	15A
CLOUD HEIGHT SENSOR	1000 VA MAX.	20A
LIGHTNING SENSOR	200 VA MAX.	15A
FREEZING RAIN SENSOR	400 VA MAX.	15A
OTHER SENSORS, AS APPLICABLE	1000 VA MAX.	20A EACH

CENTRAL DATA PROCESSOR		
CENTRAL DATA PROCESSING EQUIPMENT	600VA MAX.	15A

POWER REQUIREMENTS

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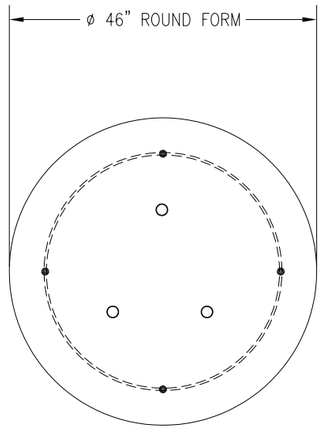
NOTES: CONT'D

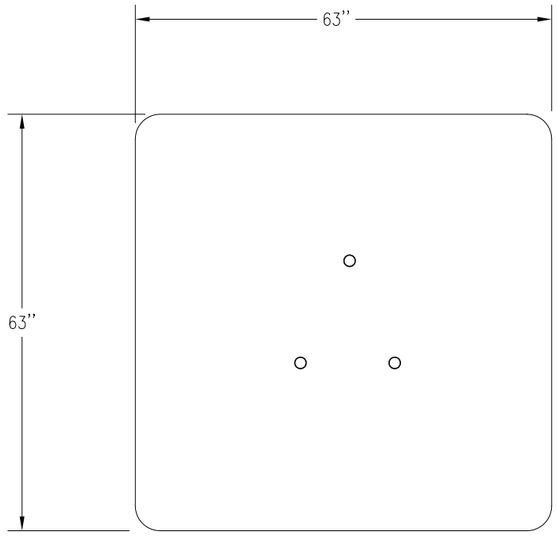
2 THE TOWER MUST BE MOUNTED IN A CONCRETE BASE. A FOOTING SECTION IS INCLUDED WITH THE TOWER, AND THIS SECTION IS SET IN THE CONCRETE ACCORDING TO THE SPECIFICATIONS SHOWN. THE BASE OF THE FOOTING SECTION SHOULD EXTEND FOUR INCHES BELOW THE CONCRETE INTO COMPACTED SAND AND GRAVEL TO ALLOW FOR DRAINAGE.

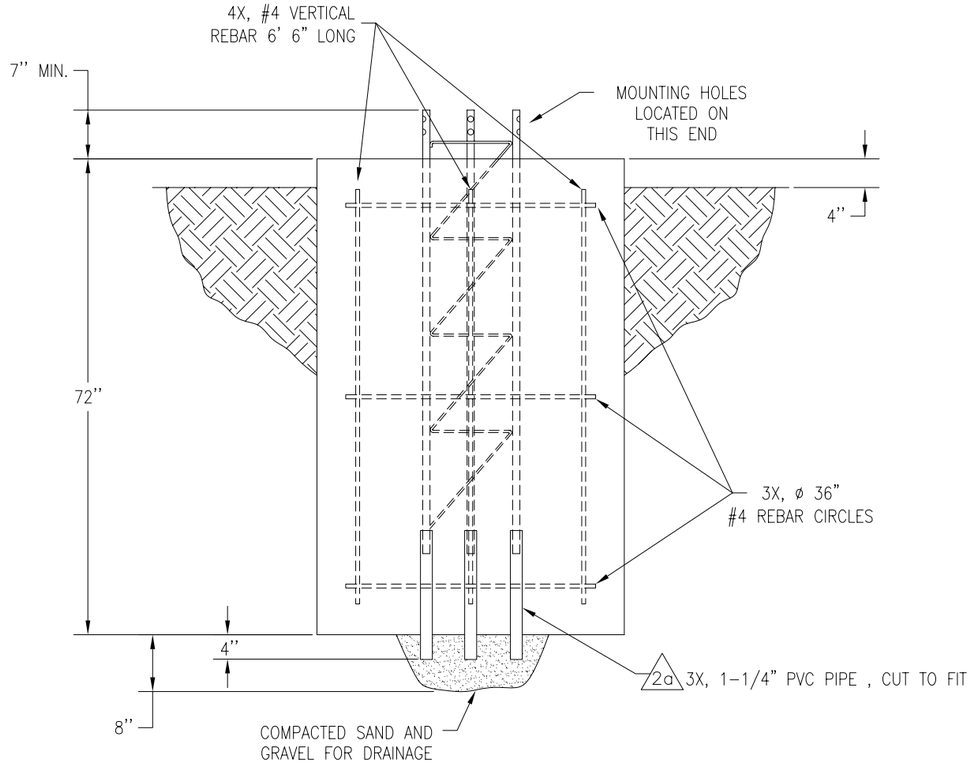
2a FOR THE CYLINDRICAL FOUNDATION ONLY: INSTALL PVC PIPE TO THE BOTTOM OF THE THREE TOWER LEGS EXTENDING THEM BELOW THE CONCRETE INTO THE COMPACTED SAND AND GRAVEL TO ALLOW FOR DRAINAGE.

TOLERANCE FOR LEVEL/PLUMB IS ± 2°.

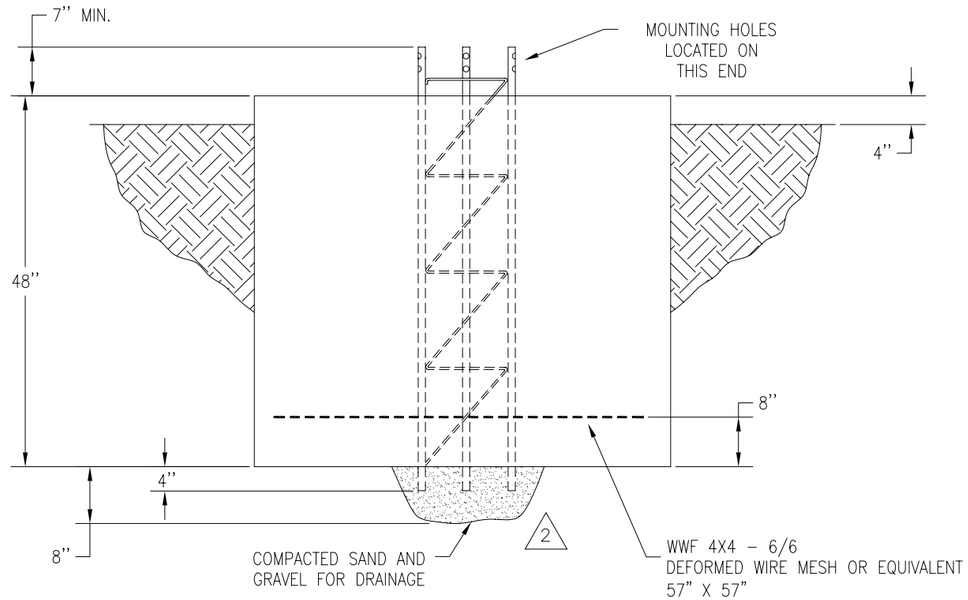
NOTE:
INCREASE FOUNDATION DEPTH ACCORDINGLY WHERE FROST MAY EXCEED 36 INCHES.






4X, #4 VERTICAL REBAR 6' 6" LONG
7'' MIN.
MOUNTING HOLES LOCATED ON THIS END
4''
72''
3X, ø 36" #4 REBAR CIRCLES
4''
8''
2a 3X, 1-1/4" PVC PIPE , CUT TO FIT
COMPACTED SAND AND GRAVEL FOR DRAINAGE

CYLINDRICAL FOUNDATION



SQUARE FOUNDATION

TOWER FOUNDATION FOR 8509 STACKED TOWER

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SIZE	DWG NO.	
D	3000-Z-007	
SCALE NONE	REV LTR A	SHEET 3 OF 17

NOTES: CONT'D

3 TOWER SITE AND FOUNDATION

1. LOCATE AND ORIENT THE TOWER CONSIDERING THE FOLD OVER POSITION. WHEN IN THE FOLD OVER POSITION, THE TOWER EXTENDS APPROXIMATELY 25 FEET HORIZONTALLY FROM THE CENTER OF THE TOWER FOOTING. MAKE CERTAIN THE PROPOSED FOLD OVER AREA IS CLEAR OF ANY EQUIPMENT, POWER LINES, BUILDINGS, TREES, ETC. WITHIN 25 FEET OF TOWER FOOTING. ALSO PROVIDE CLEARANCE FOR THE MAST PIPE PROTRUDING APPROXIMATELY 6 FEET FROM THE CENTER OF THE FOOTING OPPOSITE THE TOWER WHEN THE TOWER IS IN THE FOLD OVER POSITION. MAINTAIN AT LEAST ONE AND ONE-HALF TO TWICE THE HEIGHT OF THE TOWER FROM ALL POWER LINES. ONCE THE TOWER FOUNDATION/FOOTING IS IN PLACE, THE TOWER CAN BE MOUNTED IN ANY OF THREE POSITIONS, 120 DEGREES APART.

2. BOLT THREE LEGS OF THE TOWER FOOTING SECTION TOGETHER (SEE NOTES THIS PAGE) AND SLIP THE BOTTOM TOWER SECTION INTO THE TOWER FOOTING SECTION.

3. ALIGN FIXED TOWER FOOTING SECTION AND TOWER LEG HOLES, THEN REAM 5/16" HOLES IN 18 PLACES (FROM SQUARE HOLES TO ROUND HOLES) IN THE TOWER LEGS.

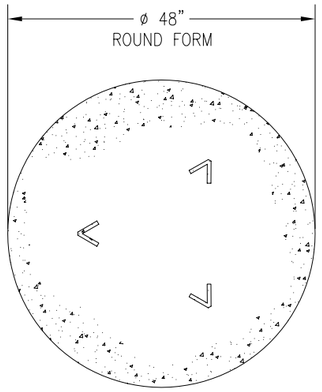
4. BOLT FIXED TOWER FOOTING SECTION TO FIRST SECTION OF TOWER PRIOR TO SETTING FIXED TOWER FOOTING SECTION IN THE HOLE (WITH 5/16" HEX HEAD BOLTS AND NUTS, 18 PLACES).

5. THE STEEL PORTION OF THE TOWER FOOTING SECTION LEGS SHOULD EXTEND ABOUT NINE INCHES FROM THE TOP OF THE CONCRETE SO THAT ALUMINUM TOWER SECTIONS NEVER COME IN CONTACT WITH THE CONCRETE DIRECTLY.

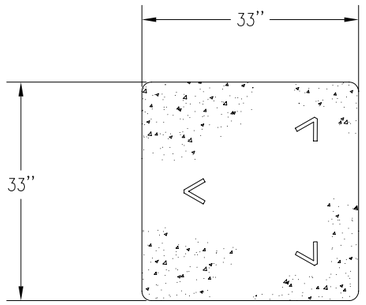
6. THE TOWER FOOTING SECTION ASSEMBLY AND FIRST TOWER SECTION SHOULD BE LEVELED, PLUMBED AND TEMPORARILY GUYED OR BRACED WHILE POURING THE CONCRETE. TOLERANCE FOR PLUMB/LEVEL IS ± 2°.

7. CROWN THE TOP OF THE CONCRETE SLIGHTLY TO PREVENT WATER ACCUMULATION.

8. TAKE CARE THAT ALL JOINING TOWER SURFACES ARE FLUSH.

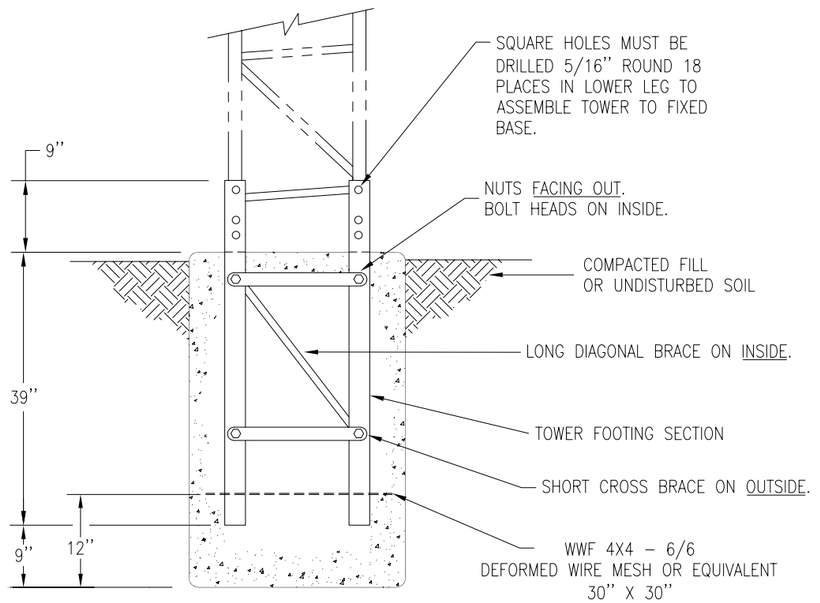


OR



TOP VIEW

THE CONCRETE MUST HAVE 3,000 PSI MINIMUM 28-DAY COMPRESSIVE STRENGTH. THE FOUNDATION SHALL BE DESIGNED BY THE INSTALLER FOR 2,000 PSF SOIL BEARING CAPACITY. IT MAY BE NECESSARY TO SECURE THE SERVICES OF GEOTECHNICAL ENGINEER TO VERIFY SOIL CAPACITY AT THE INSTALLATION SITE, AND, IF NECESSARY, TO RECOMMEND ALTERATION WHEN SOIL CONDITIONS ARE QUESTIONABLE.


SQUARE HOLES MUST BE DRILLED 5/16" ROUND 18 PLACES IN LOWER LEG TO ASSEMBLE TOWER TO FIXED BASE.
NUTS FACING OUT. BOLT HEADS ON INSIDE.
COMPACTED FILL OR UNDISTURBED SOIL
LONG DIAGONAL BRACE ON INSIDE.
TOWER FOOTING SECTION
SHORT CROSS BRACE ON OUTSIDE.
WWF 4X4 - 6/6 DEFORMED WIRE MESH OR EQUIVALENT 30" X 30"
9"
39"
9"
12"

*INCREASE FOUNDATION DEPTH ACCORDINGLY PER LOCAL CODES WHERE FROST MAY EXCEED 36 INCHES.

FOLDOVER TOWER FOUNDATION DETAIL 3

TOWER FOUNDATION FOR 8518-A FOLDOVER TOWER

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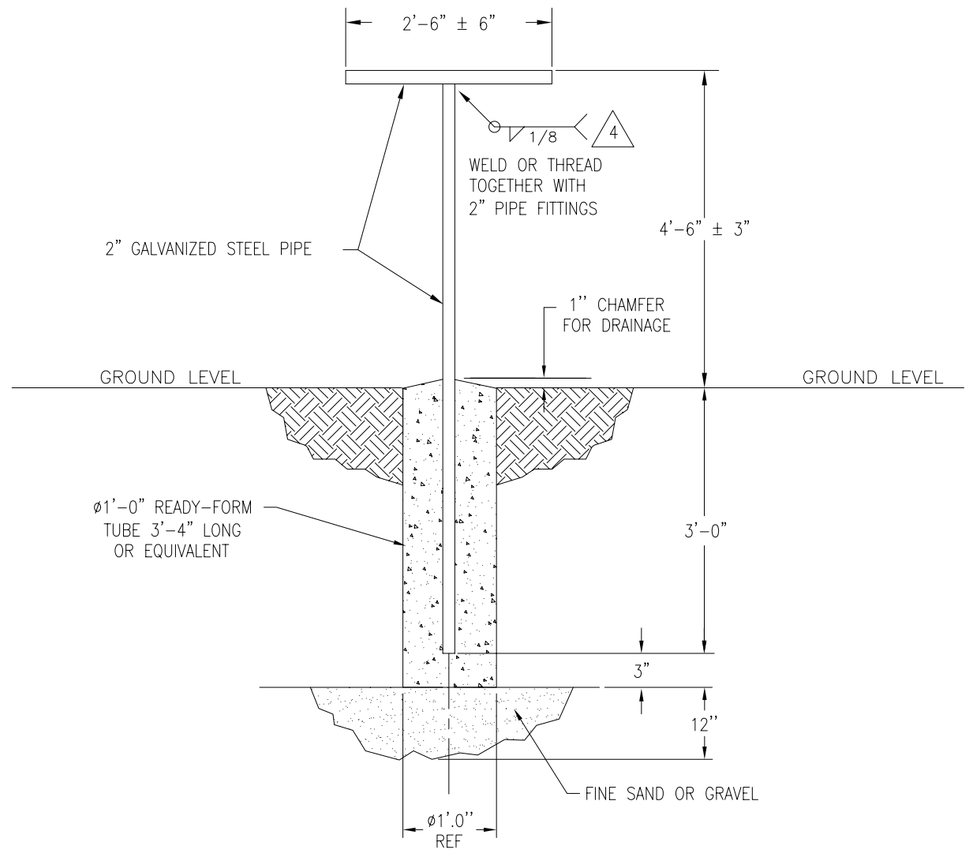
SIZE	DWG NO.	
D	3000-Z-007	
SCALE NONE	REV LTR A	SHEET 4 OF 17

NOTE:
INCREASE FOUNDATION ACCORDINGLY WHERE FROST MAY EXCEED 12 INCHES.

4 ALL WELDS MUST BE COATED WITH ANTI-RUST GRAY COLORED PAINT.



CRADLE FOUNDATION FOR 8518-A FOLDOVER TOWER

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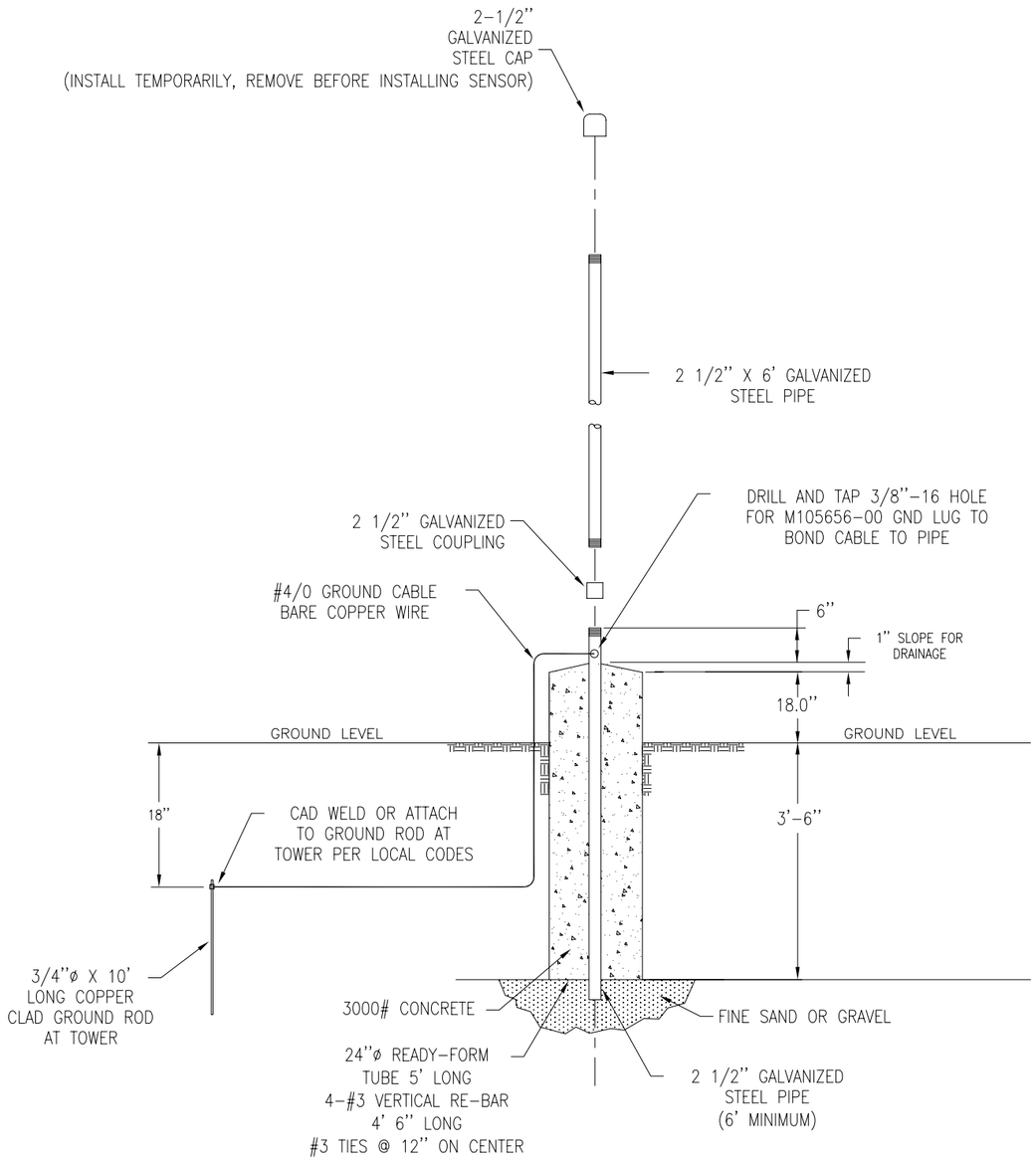
SIZE	DWG NO.	
D	3000-Z-007	
SCALE NONE	REV LTR A	SHEET 5 OF 17

NOTE:
INCREASE FOUNDATION ACCORDINGLY WHERE FROST MAY EXCEED 36 INCHES.


2–1/2" GALVANIZED STEEL CAP
(INSTALL TEMPORARILY, REMOVE BEFORE INSTALLING SENSOR)
2 1/2" X 6' GALVANIZED STEEL PIPE
2 1/2" GALVANIZED STEEL COUPLING
DRILL AND TAP 3/8"–16 HOLE FOR M105656–00 GND LUG TO BOND CABLE TO PIPE
#4/0 GROUND CABLE BARE COPPER WIRE
6"
1" SLOPE FOR DRAINAGE
18.0"
GROUND LEVEL
GROUND LEVEL
18"
CAD WELD OR ATTACH TO GROUND ROD AT TOWER PER LOCAL CODES
3'–6"
3/4"ø X 10' LONG COPPER CLAD GROUND ROD AT TOWER
3000# CONCRETE
FINE SAND OR GRAVEL
24"ø READY–FORM TUBE 5' LONG 4–#3 VERTICAL RE–BAR 4' 6" LONG #3 TIES @ 12" ON CENTER
2 1/2" GALVANIZED STEEL PIPE (6' MINIMUM)

VISIBILITY SENSOR FOUNDATION

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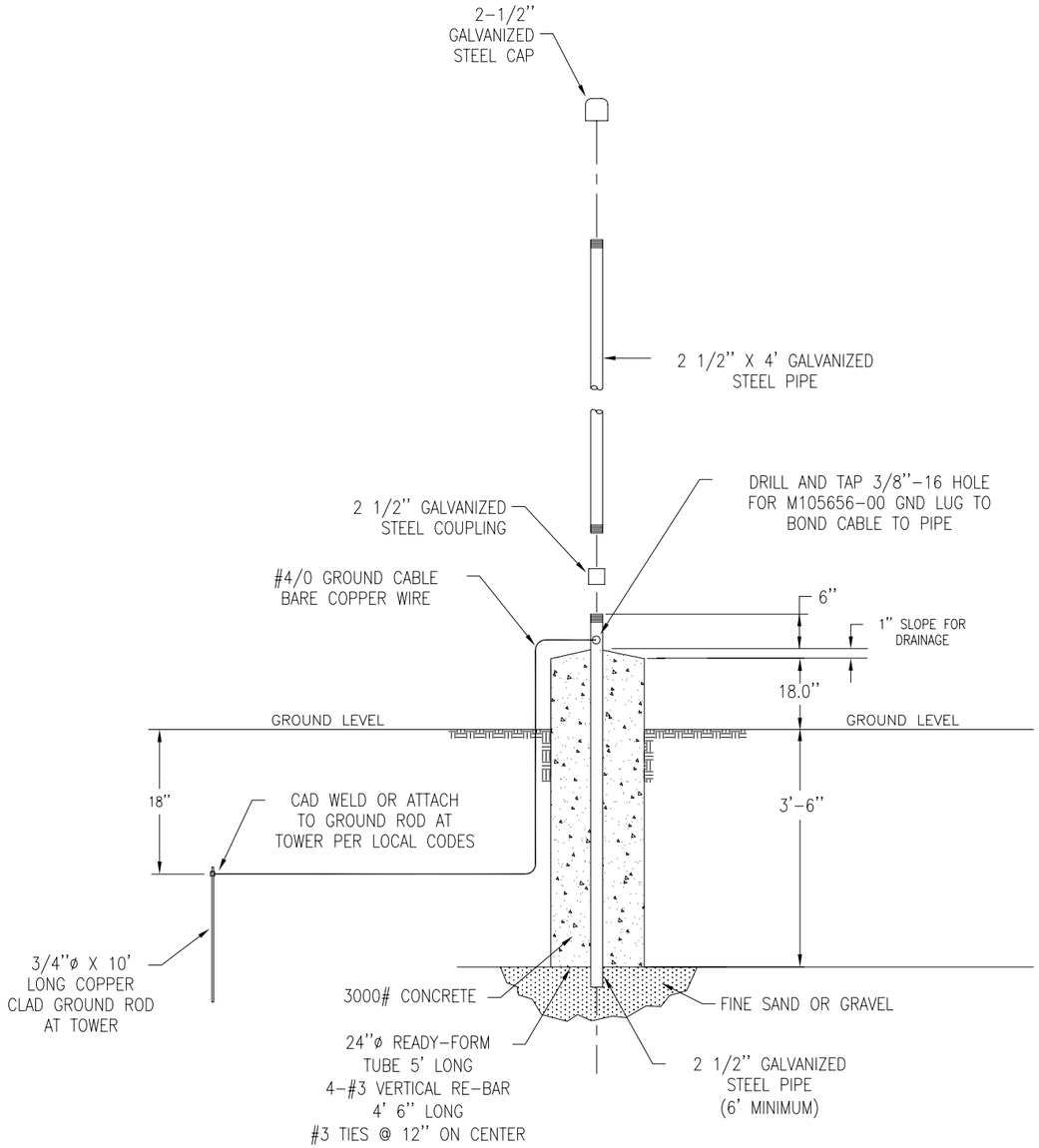
SIZE	DWG NO.	
D	3000–Z–007	
SCALE NONE	REV LTR A	SHEET 6 OF 17

NOTE:
INCREASE FOUNDATION ACCORDINGLY WHERE FROST MAY EXCEED 36 INCHES.


2–1/2" GALVANIZED STEEL CAP
2 1/2" X 4' GALVANIZED STEEL PIPE
2 1/2" GALVANIZED STEEL COUPLING
DRILL AND TAP 3/8"–16 HOLE FOR M105656–00 GND LUG TO BOND CABLE TO PIPE
#4/0 GROUND CABLE BARE COPPER WIRE
6"
1" SLOPE FOR DRAINAGE
18.0"
GROUND LEVEL
GROUND LEVEL
18"
CAD WELD OR ATTACH TO GROUND ROD AT TOWER PER LOCAL CODES
3'–6"
3/4"ø X 10' LONG COPPER CLAD GROUND ROD AT TOWER
3000# CONCRETE
FINE SAND OR GRAVEL
24"ø READY–FORM TUBE 5' LONG 4–#3 VERTICAL RE–BAR 4' 6" LONG #3 TIES @ 12" ON CENTER
2 1/2" GALVANIZED STEEL PIPE (6' MINIMUM)

CEILOMETER FOUNDATION

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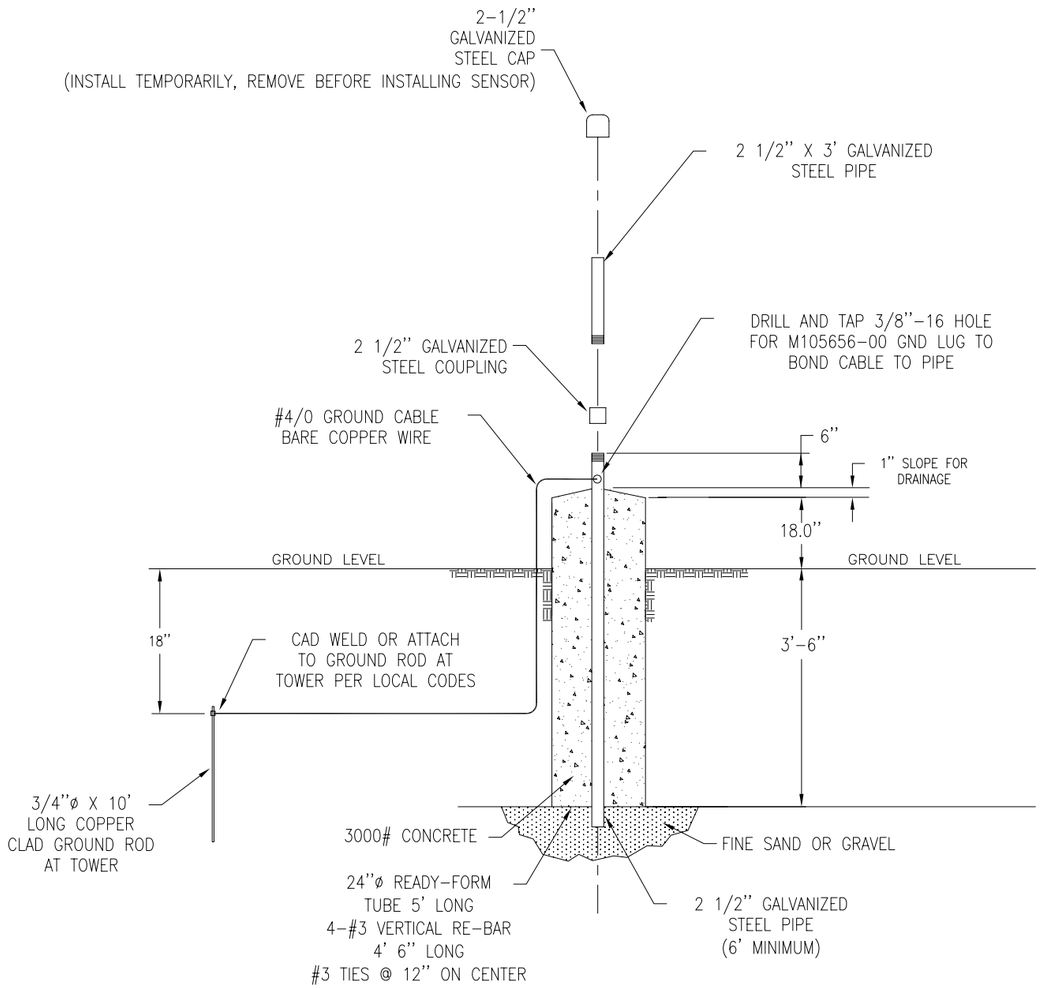
SIZE	DWG NO.	
D	3000–Z–007	
SCALE NONE	REV LTR A	SHEET 7 OF 17

NOTE:
INCREASE FOUNDATION ACCORDINGLY WHERE
FROST MAY EXCEED 36 INCHES.


2–1/2" GALVANIZED STEEL CAP (INSTALL TEMPORARILY, REMOVE BEFORE INSTALLING SENSOR)
2 1/2" X 3' GALVANIZED STEEL PIPE
2 1/2" GALVANIZED STEEL COUPLING
DRILL AND TAP 3/8"–16 HOLE FOR M105656–00 GND LUG TO BOND CABLE TO PIPE
#4/0 GROUND CABLE BARE COPPER WIRE
6"
1" SLOPE FOR DRAINAGE
18.0"
GROUND LEVEL
GROUND LEVEL
18"
CAD WELD OR ATTACH TO GROUND ROD AT TOWER PER LOCAL CODES
3'–6"
3/4"ø X 10' LONG COPPER CLAD GROUND ROD AT TOWER
3000# CONCRETE
FINE SAND OR GRAVEL
24"ø READY–FORM TUBE 5' LONG 4–#3 VERTICAL RE–BAR 4' 6" LONG #3 TIES @ 12" ON CENTER
2 1/2" GALVANIZED STEEL PIPE (6' MINIMUM)

LIGHTNING SENSOR FOUNDATION

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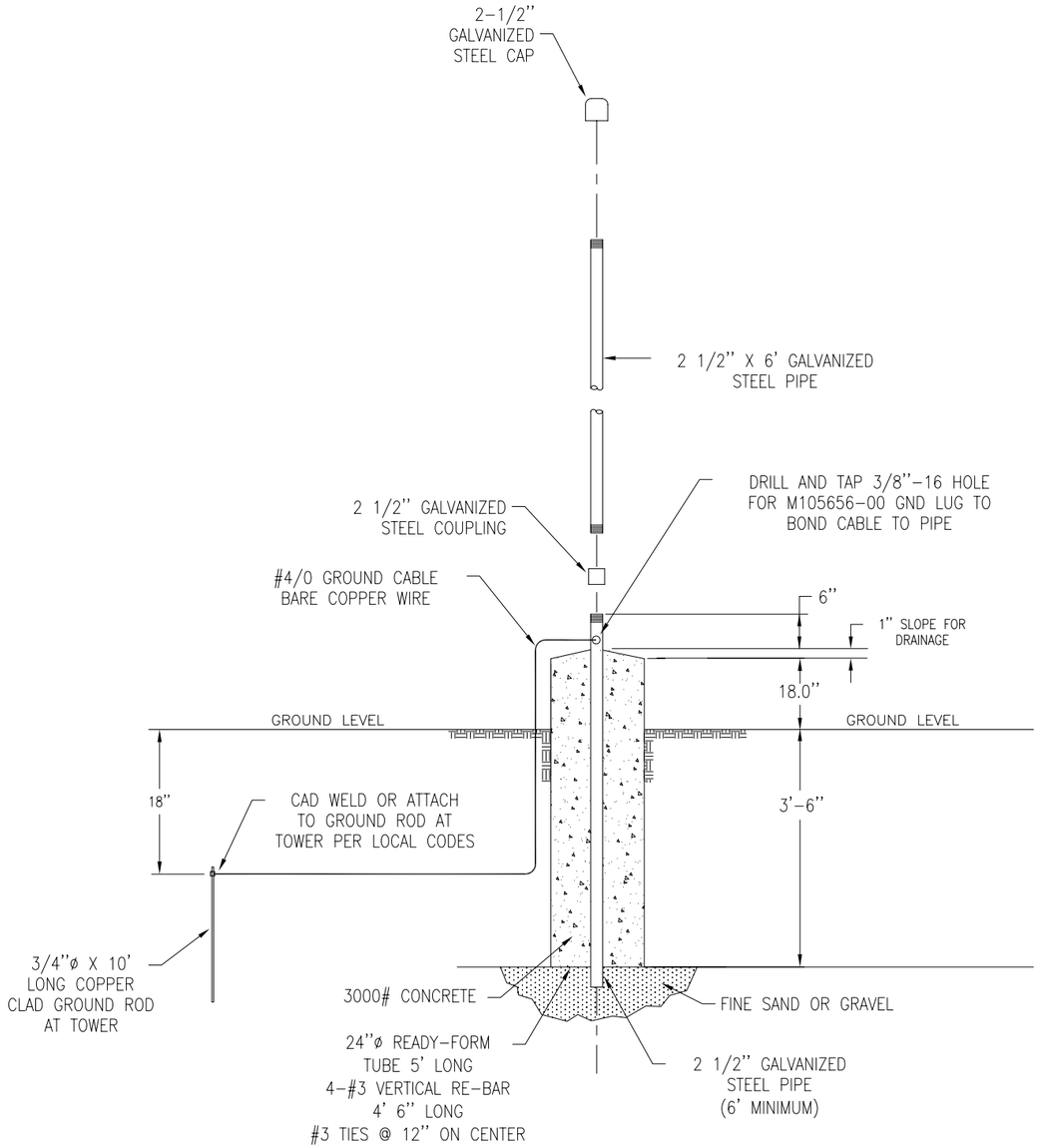
SIZE	DWG NO.	
D	3000–Z–007	
SCALE NONE	REV LTR A	SHEET 8 OF 17

NOTE:
INCREASE FOUNDATION ACCORDINGLY WHERE FROST MAY EXCEED 36 INCHES.


2–1/2" GALVANIZED STEEL CAP
2 1/2" X 6' GALVANIZED STEEL PIPE
2 1/2" GALVANIZED STEEL COUPLING
DRILL AND TAP 3/8"–16 HOLE FOR M105656–00 GND LUG TO BOND CABLE TO PIPE
#4/0 GROUND CABLE BARE COPPER WIRE
6"
1" SLOPE FOR DRAINAGE
18.0"
GROUND LEVEL
GROUND LEVEL
18"
CAD WELD OR ATTACH TO GROUND ROD AT TOWER PER LOCAL CODES
3'–6"
3/4"ø X 10' LONG COPPER CLAD GROUND ROD AT TOWER
3000# CONCRETE
FINE SAND OR GRAVEL
24"ø READY–FORM TUBE 5' LONG 4–#3 VERTICAL RE–BAR 4' 6" LONG #3 TIES @ 12" ON CENTER
2 1/2" GALVANIZED STEEL PIPE (6' MINIMUM)

FREEZING RAIN SENSOR FOUNDATION

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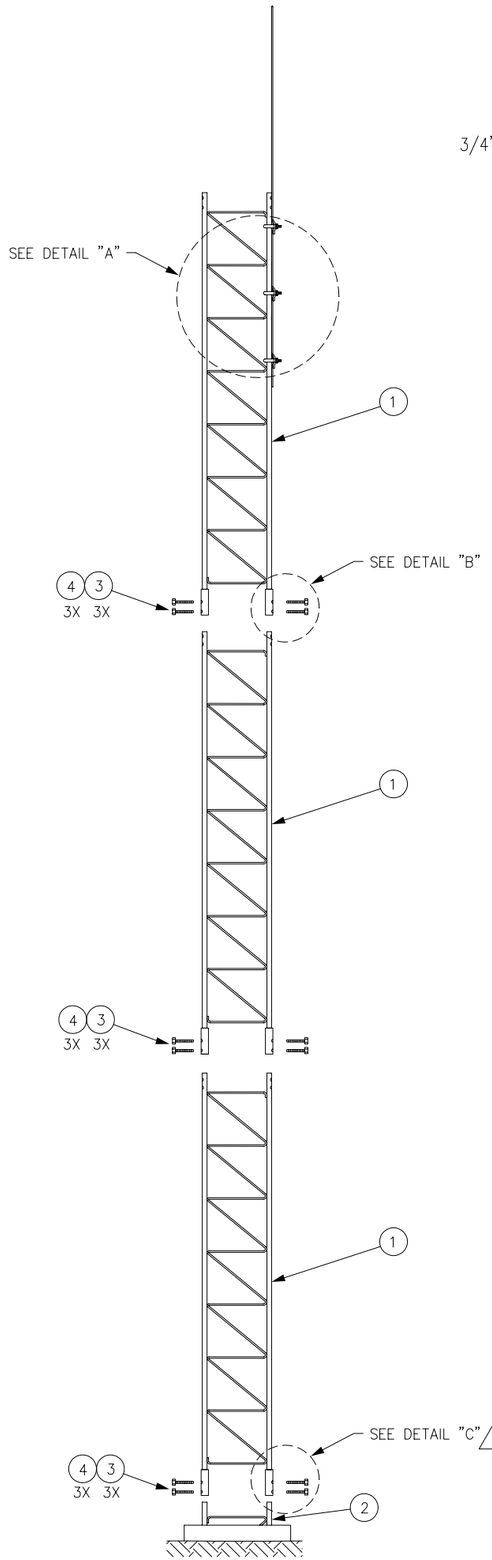
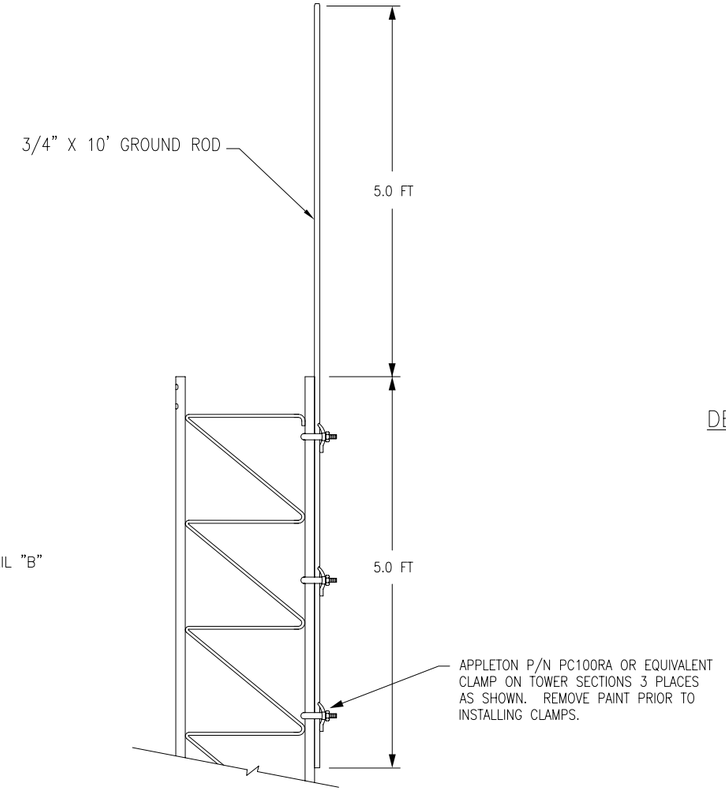
SIZE	DWG NO.	
D	3000–Z–007	
SCALE NONE	REV LTR A	SHEET 9 OF 17

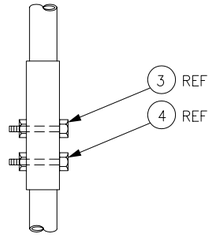
NOTES: CONT'D

5 ATTACH GROUND LUG UNDER BOLT ITEM 4 ON TOWER LEG CLOSEST TO GROUND CABLE.

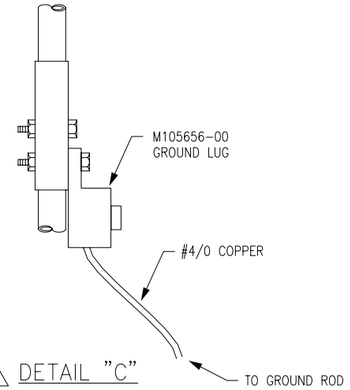



3/4" X 10' GROUND ROD
5.0 FT
5.0 FT
APPLETON P/N PC100RA OR EQUIVALENT CLAMP ON TOWER SECTIONS 3 PLACES AS SHOWN. REMOVE PAINT PRIOR TO INSTALLING CLAMPS.

DETAIL "A"



DETAIL "B" 8X



5 DETAIL "C"

ITEM	PART NO.	DESCRIPTION	QTY.
1	T995065	TOWER SECTION *	3
2	T995064	SHORT BASE *	1
3	INCLUDED	7/16" X 2 1/2" NC BOLT WITH NUT *	9
4	INCLUDED	5/16" X 2 3/8" NC BOLT WITH NUT *	9

* SUPPLIED BY ALL WEATHER INC.
PAINTED PER FAA REQUIREMENTS

8509 STACKED TOWER INSTALLATION

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SIZE	DWG NO.	
D	3000-Z-007	
SCALE NONE	REV LTR A	SHEET 10 OF 17

NOTES: CONT'D

6. TOWER ASSEMBLY AND INSTALLATION, MODEL 8518-A

THE ASSEMBLY AND INSTALLATION OF THE MODEL 8518-A, PAINTED TOWER, IS WITH ALTERNATING WHITE AND ORANGE SECTIONS ENDING WITH AN ORANGE SECTION ON THE TOP.

1. WINCH ASSEMBLY THREAD THE HANDLE ONTO THE WINCH DRIVE SHAFT AND BE CERTAIN THAT A CLICKING NOISE IS PRODUCED WHEN THE HANDLE IS TURNED CLOCKWISE. INSTALL THE SPRING AND LOCK NUT ON THE END OF THE DRIVE SHAFT. THESE PARTS MAY APPEAR TO SERVE NO FUNCTION, BUT THEY PROVIDE SEVERAL IMPORTANT FAIL-SAFE FEATURES AND SHOULD NOT BE ALTERED OR REMOVED.

2. ASSEMBLE TOWER FOOTING SECTION PER SHEET 6 OF THIS DRAWING.

3. BEFORE ASSEMBLING THE TOWER SECTIONS TOGETHER, REMOVE PAINT FROM CONNECTING PIECES BY BRUSHING OR SANDING TO BARE METAL TO ENSURE PROPER CONDUCTIVITY.

4. LAY THE 3 10-FOOT SECTIONS OF THE TOWER END TO END ON THE GROUND IN THE POSITION OF FINAL ASSEMBLY.

5. BOLT THE WINCH ASSEMBLY TO THE WINCH PLATE ON THE FIRST TOWER SECTION USING TWO 3/8" BOLTS AND FLAT WASHERS ON THE LOWER HOLES AND TWO 5/16" BOLTS ON THE TOP HOLES.

6. THE HINGE ASSEMBLY IS PRE ASSEMBLED TO THE TOP OF THE FIRST 10-FOOT SECTION AT THE 10 FOOT LEVEL. POSITION THE SECOND 10-FOOT SECTION OF THE TOWER IN THE HINGE ASSEMBLY SO THE 12 MOUNTING HOLES ALIGN. DRILL THROUGH THE MOUNTING HOLES WITH A 5/16" BIT TO ENLARGE THE SQUARE HOLES IN THE TOWER LEGS. SECURE THE HINGE ASSEMBLY TO THE TOWER SECTION WITH TWELVE 5/16" HEX HEAD BOLTS AND NUTS.

7. ASSEMBLE TOGETHER THE SECOND AND THIRD 10-FOOT TOWER SECTIONS BY SLIDING INTO THE ADJOINING SECTION. (LOOSENING SEVERAL OF THE ADJACENT CROSS AND DIAGONAL BRACE BOLTS MAY FACILITATE SLIDING THE TOWER SECTIONS TOGETHER. BE CERTAIN TO RETIGHTEN ANY BOLTS LOOSENED.) ATTACH THE HORIZONTAL AND DIAGONAL CROSS BRACES AT THE JOINTS OF THE 10-FOOT TOWER SECTIONS. USE 1/4" CARRIAGE BOLTS AND NUTS. MAKE CERTAIN THE SQUARE SHOULDER OF THE CARRIAGE BOLT IS PROPERLY SEATED AND TORQUE THE NUTS TO 9 FOOT-POUNDS.

8. USE FOUR U-BOLTS AND SADDLES PLACED BETWEEN THE MAST PIPE AND THE MAST MOUNTS TO ATTACH THE MAST PIPE TO THE TOWER. REMOVE PAINT FROM TOWER PARTS THAT CONNECT TO THE MAST FOR INCREASED CONDUCTIVITY. CHECK THE LOCATION OF THE BOTTOM OF THE MAST PIPE TO MAKE SURE THE LOCK TAB ALIGNS WITH THE LOCK HOLE IN THE WINCH PLATE. TIGHTEN THE FOUR NUTS ON THE TWO U-BOLTS ABOVE THE HINGE. LEAVE THE LOWER FOUR NUTS AND TWO U-BOLTS LOOSE FOR REMOVAL DURING TOWER ERECTION.

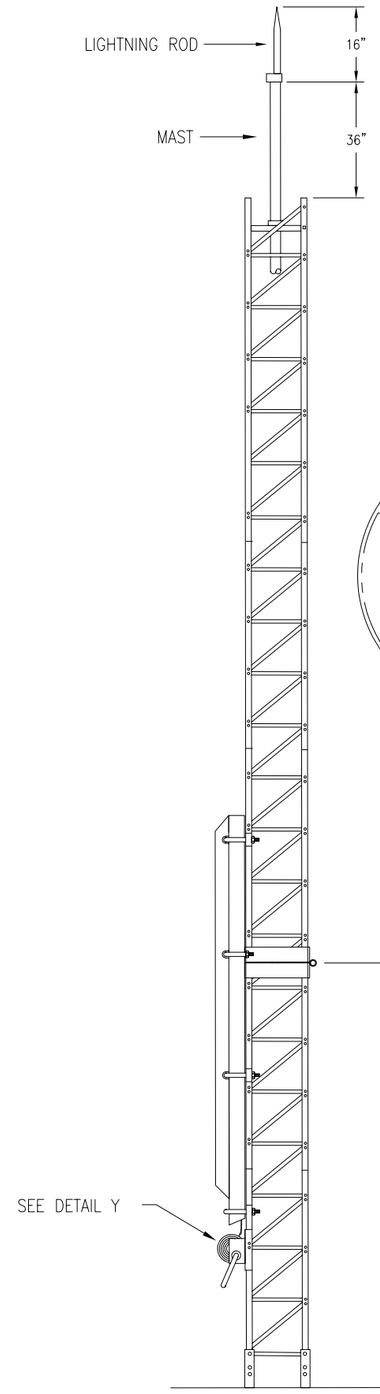
9. INSERT THE WINCH WIRE ROPE THROUGH THE 1/4" HOLE IN THE LOWER END OF THE MAST PIPE. ROUTE AND SECURE THE LOOSE END OF WIRE ROPE TO THE WINCH PER DETAIL Y, WITH THE CLAMPS PROVIDED. WIND UP THE EXCESS WIRE ROPE ON THE WINCH BY TURNING THE WINCH HANDLE CLOCKWISE.

10. REMOVE THE LOWER FOUR NUTS AND TWO U-BOLTS ON THE LOWER PORTION OF THE MAST PIPE. ALLOW THE WIRE ROPE TO UNWIND FROM THE WINCH AS YOU BEND THE TOWER HINGE AT THE 10 FOOT LOCATION. INSTALL THE TOWER ONTO THE FOUNDATION BY VERTICALLY ERECTING THE LOWER 10 FEET (BELOW THE HINGE) OF THE TOWER AT THE SAME TIME ALLOWING THE UPPER 20 FEET TO HINGE OVER AND REMAIN IN CONTACT WITH THE GROUND. CARE SHOULD BE TAKEN NOT TO DAMAGE THE TOP END OF THE TOWER IN CONTACT WITH THE GROUND. PLUMB THE TOWER TO WITHIN ±2° AND SECURE THE TOWER TO THE FOUNDATION WITH EIGHTEEN 5/16" BOLTS AND NUTS PER DETAIL W.

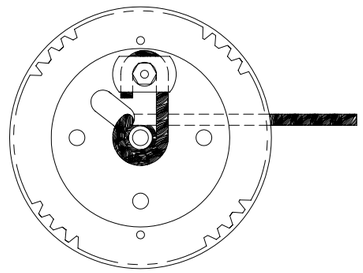
11. INSTALL THE 18" ALUMINUM LIGHTNING ROD TO THE TOP OF THE MAST WITH THE MOUNTING CLAMP PER DETAIL Z.

12. CONNECT THE COPPER GROUND WIRE TO THE TOWER BASE WITH GROUND WIRE CLAMP PER DETAIL V.

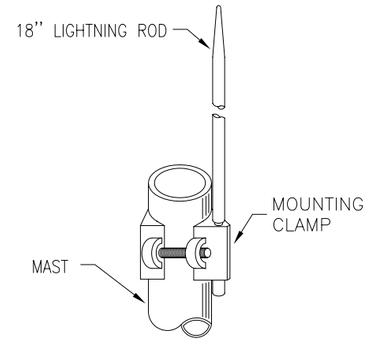
13. ERECT THE TOP 20 FEET OF THE TOWER BY TURNING THE WINCH HANDLE CLOCKWISE UNTIL THE TOWER IS VERTICAL. SECURE THE MAST PIPE TO THE LOWER TOWER SECTION WITH THE FOUR NUTS AND TWO U-BOLTS. INSTALL A PAD LOCK (CUSTOMER FURNISHED) BETWEEN THE MAST PIPE AND THE WINCH MOUNTING PLATE TO PREVENT ANY UNWANTED LOWERING OF THE TOWER.



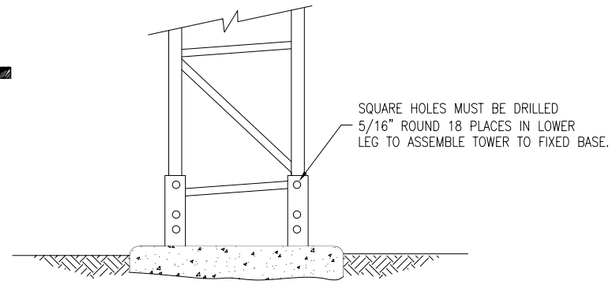
8518-A FOLDOVER TOWER INSTALLATION



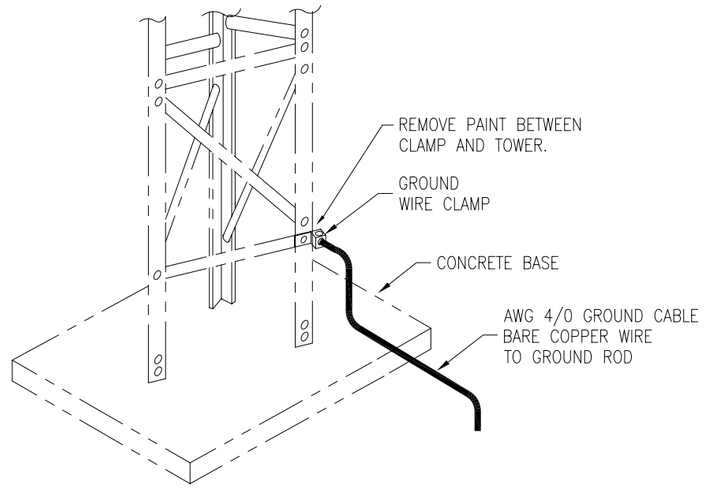
DETAIL Y
WINCH CABLE
ANCHORING METHOD



DETAIL Z
LIGHTNING ROD INSTALLATION



DETAIL W
TOWER ATTACHMENT



DETAIL V
GROUND CABLE INSTALLATION

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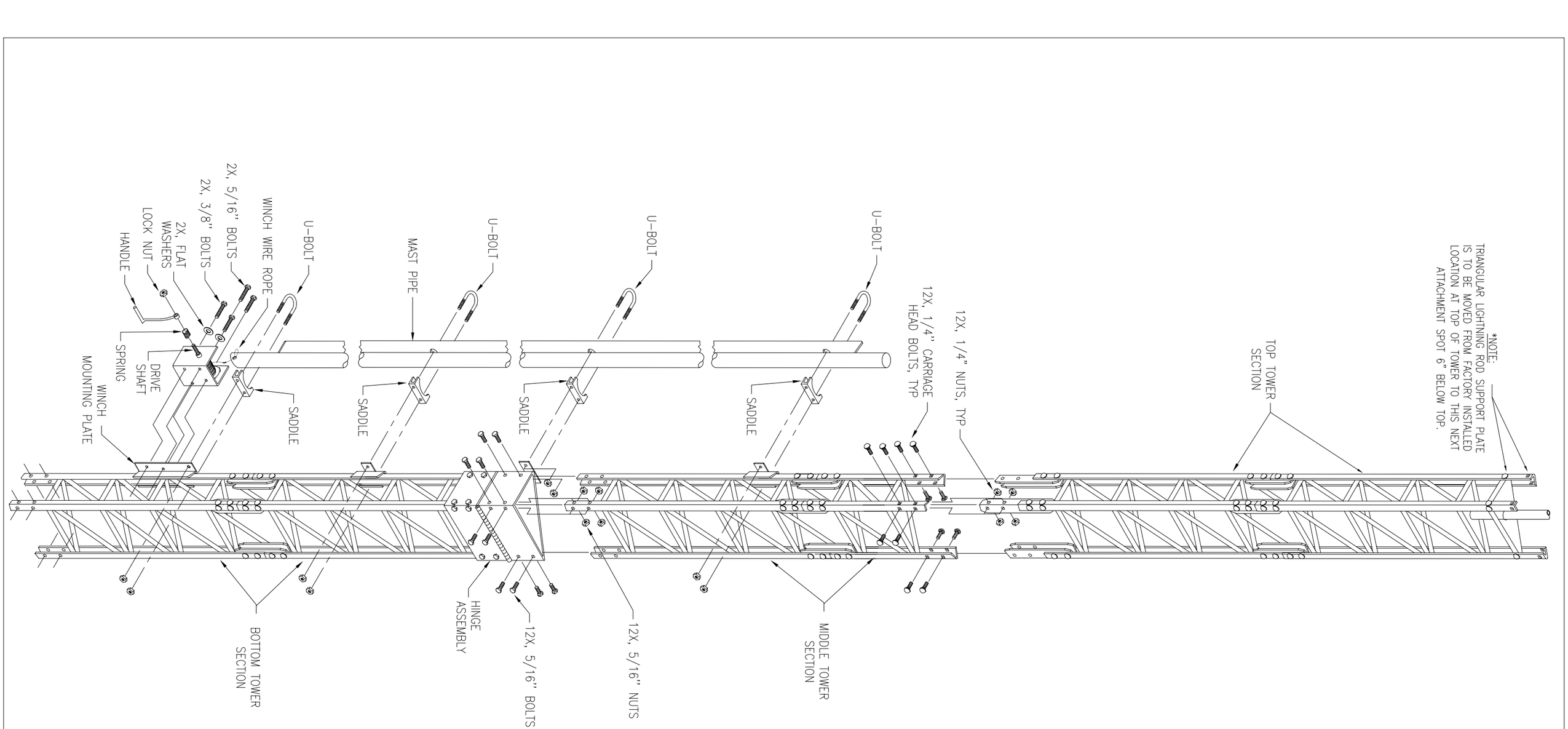
SIZE	DWG NO.	
D	3000-Z-007	
SCALE NONE	REV LTR A	SHEET 11 OF 17



8518-A FOLDOVER TOWER INSTALLATION

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SIZE	DWG NO.	
D	3000-Z-007	
SCALE NONE	REV LTR A	SHEET 12 OF 17

NOTES: CONT'D

INSTALLATION FOR MODEL 8509 STACKED TOWER

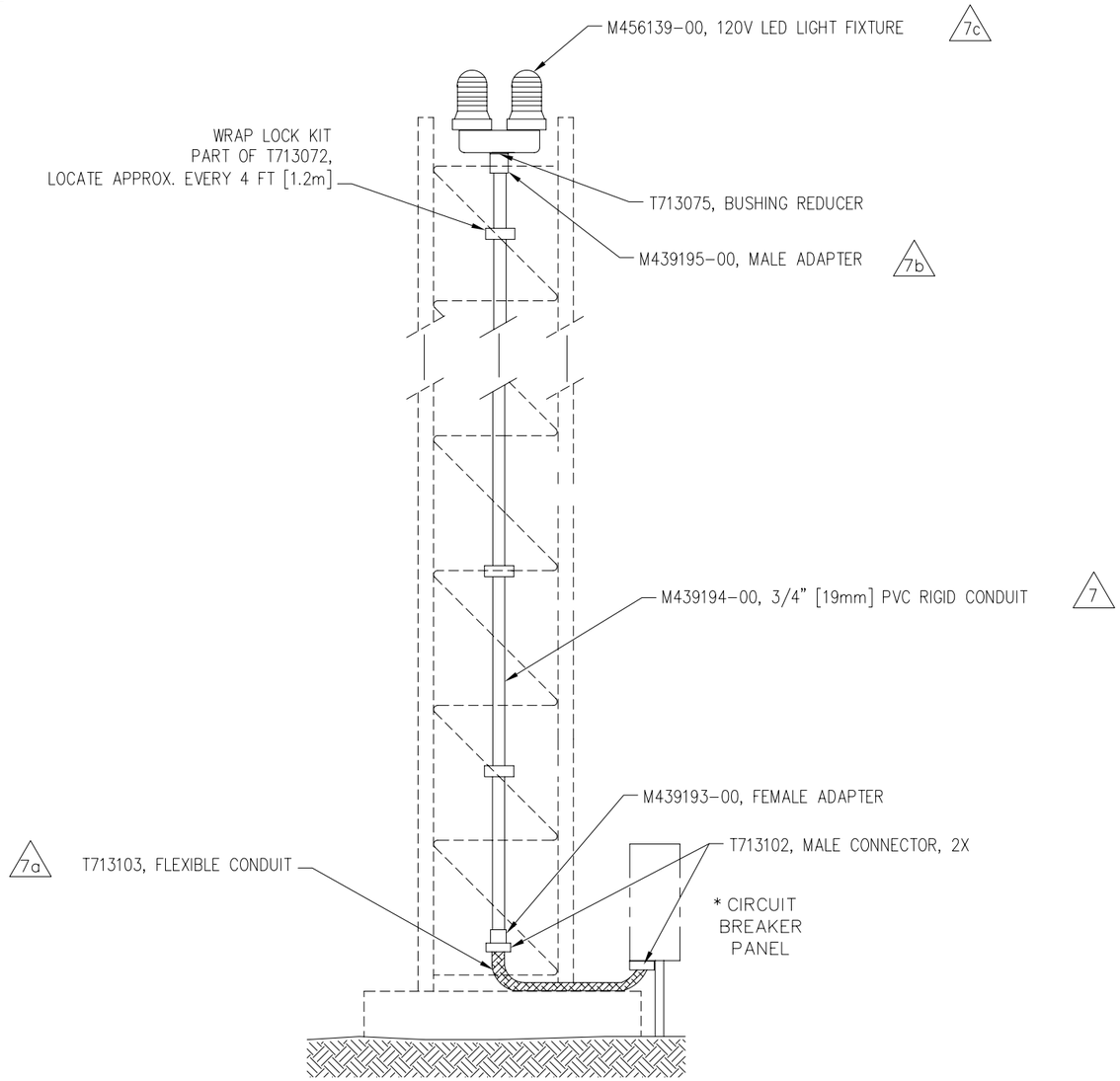
7 CUT CONDUIT LENGTH AS REQUIRED TO FIT INSTALLATION. INSTALL THE OBSTRUCTION LIGHT CONDUIT ON THE INSIDE OF THE TOWER FRAME TO ALLOW FOR MOUNTING OTHER EQUIPMENT ON THE OUTSIDE TOWER FACES.

7a CUT FLEXIBLE CONDUIT AS REQUIRED.

7b ATTACH ADAPTERS AND CONDUIT TOGETHER WITH PVC CEMENT.

7c WIRE TOWER LIGHTS IN PARALLEL.

* CUSTOMER SUPPLIED



DIRECTIONS FOR USING "WRAPLOCK"

CUT OFF BAND TO PROPER LENGTH
(SEE TABLE ON COVER OF BOX)

1. PASS ONE END THROUGH YOKE AND BEND BACK ABOUT 1-1/2" [38.1mm] AND FLATTEN DOWN.
2. PASS BAND AROUND WORK AND THROUGH YOKE.
3. REPEAT AND PASS END THROUGH A SECOND TIME. DRAW UP FREE END SNUGLY WITH FINGERS OR PLIERS.
4. INSERT FREE END IN SLOT OF RATCHET.
5. TURN DOWN UNTIL CLAMP IS TIGHT.
6. BACK OFF SLIGHTLY TO REMOVE RATCHET. CLAMP IS NOW SECURELY LOCKED.

TO REMOVE "WRAPLOCK" UNCOIL END WITH RATCHET OR FINGERS. PRESS DOWN AT POINT WHERE BAND METAL HAS BEEN FORCED THROUGH CURVED PART OF YOKE.

OBSTRUCTION LIGHT INSTALLATION FOR 8509 STACKED TOWER

M488276-00 120V LED OBSTRUCTION TOWER LIGHT INSTALLATION KIT

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NOTES: CONT'D

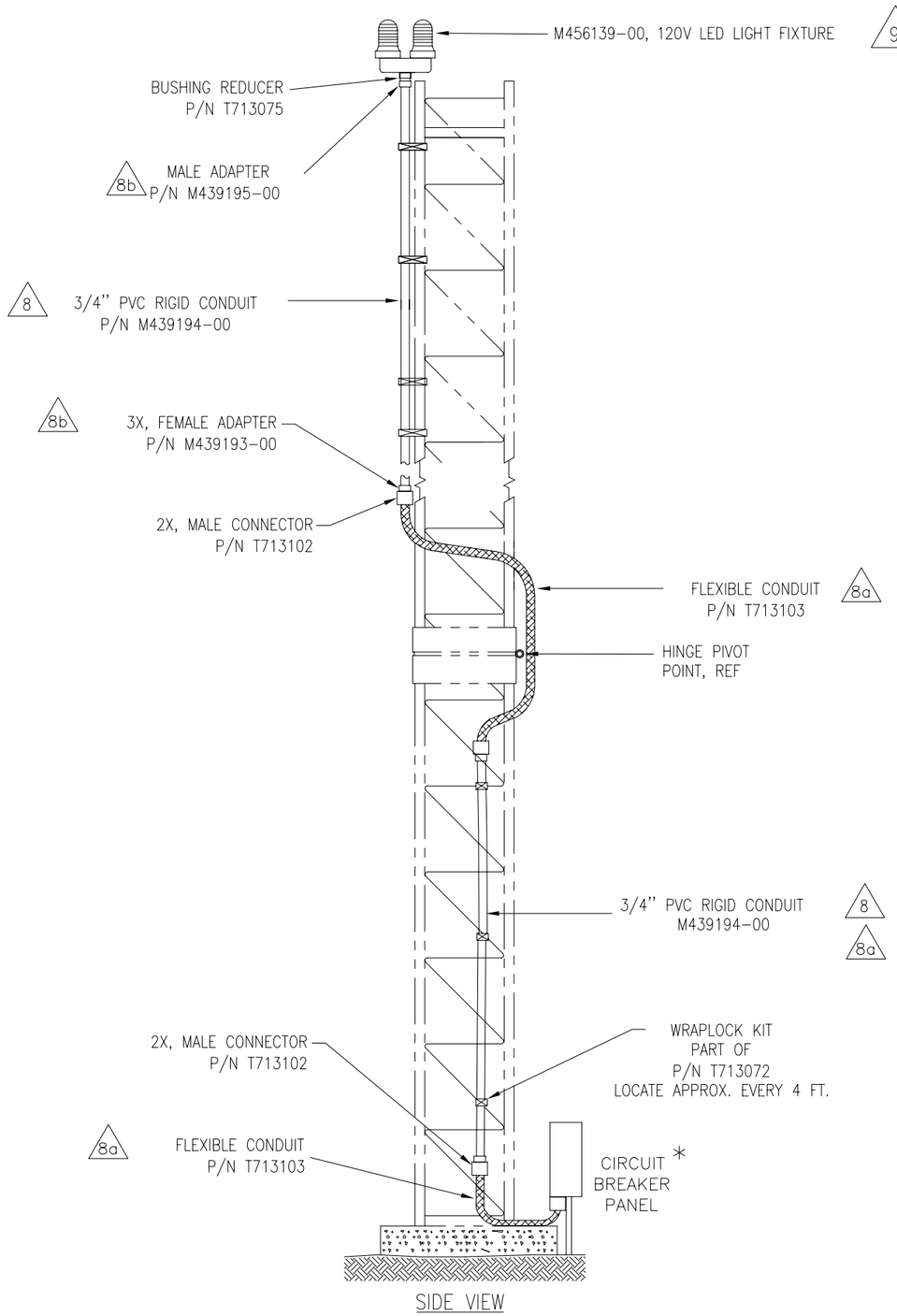
△8 CUT CONDUIT LENGTH AS REQUIRED TO FIT INSTALLATION ON THE FOLDOVER TOWER.

△8a INSTALL THE LOWER PORTION OF THE PVC CONDUIT ON THE INSIDE OF THE TOWER FRAME, ABOUT 2" [50.8mm] FROM THE TOWER LEG, ATTACHING IT TO THE TOWER CROSSMEMBERS. TRANSITION TO FLEXIBLE CONDUIT ON THE HINGE SIDE, ENSURING IT WILL NOT INTERFERE WITH THE HINGE. FIRMLY SECURE THE CONDUIT TO THE TOWER APPROXIMATELY EVERY FOUR FEET [1.2m] USING THE "WRAP LOCK" KIT PROVIDED. DO NOT CLAMP THE FLEXIBLE CONDUIT WITHIN 18" [457mm] EITHER SIDE OF THE HINGE PIVOT POINT TO ALLOW THE TOWER TO FOLD OVER. SEE DIRECTIONS FOR USING "WRAPLOCK".

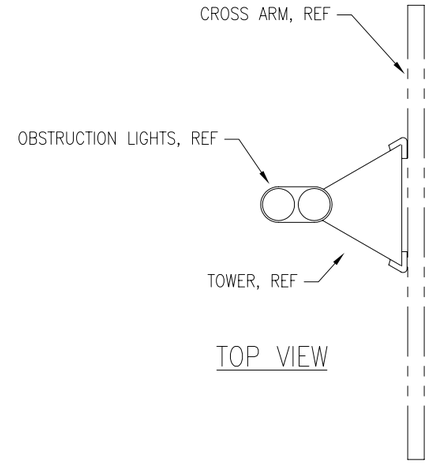
△8b ATTACH ADAPTERS AND CONDUIT TOGETHER WITH PVC CEMENT.

△9 WIRE TOWER LIGHTS IN PARALLEL.

* CUSTOMER SUPPLIED



SIDE VIEW



TOP VIEW

DIRECTIONS FOR USING "WRAPLOCK"

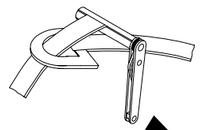
CUT OFF BAND TO PROPER LENGTH
(SEE TABLE ON COVER OF BOX)

1. PASS ONE END THROUGH YOKE AND BEND BACK ABOUT 1 1/2" AND FLATTEN DOWN.

2. PASS BAND AROUND WORK AND THROUGH YOKE.

3. REPEAT AND PASS END THROUGH A SECOND TIME. DRAW UP FREE END SNUGLY WITH FINGERS OR PLIERS.

4. INSERT FREE END IN SLOT OF RATCHET.



5. TURN DOWN UNTIL CLAMP IS TIGHT.

6. BACK OFF SLIGHTLY TO REMOVE RATCHET. CLAMP IS NOW SECURELY LOCKED.

TO REMOVE "WRAPLOCK"

UNCOIL END WITH RATCHET OR FINGERS. PRESS DOWN AT POINT WHERE BAND METAL HAS BEEN FORCED THROUGH CURVED PART OF YOKE.

OBSTRUCTION LIGHT INSTALLATION FOR 8518-A FOLDOVER TOWER

M488276-00 120V LED OBSTRUCTION TOWER LIGHT INSTALLATION KIT

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SIZE	DWG NO.	
D	3000-Z-007	
SCALE NONE	REV LTR A	SHEET 14 OF 17

NOTES: CONT'D

10. ALL CONDUIT SHOWN IS 3/4'' RIGID GALVANIZED STEEL OR EQUIVALENT.

11. INSTALL PER LOCAL BUILDING CODES.

12. ATTACH CONDUIT TO CONCRETE WITH RIGID CONDUIT STRAPS IN 2 LOCATIONS.

13. INSTALL PULL ROPES IN EACH SIGNAL CONDUIT. ALL WEATHER INC. TO INSTALL SIGNAL CABLES.

14. FOR LAND LINE DATA LINKS TO THE INDOOR EQUIPMENT, INSTALL JUNCTION BOX AND CONDUIT OR USE DIRECT BURIAL 6 CONDUCTOR RS485 CABLE AND TERMINATE WITH A JUNCTION BOX AT THE INDOOR LOCATION.

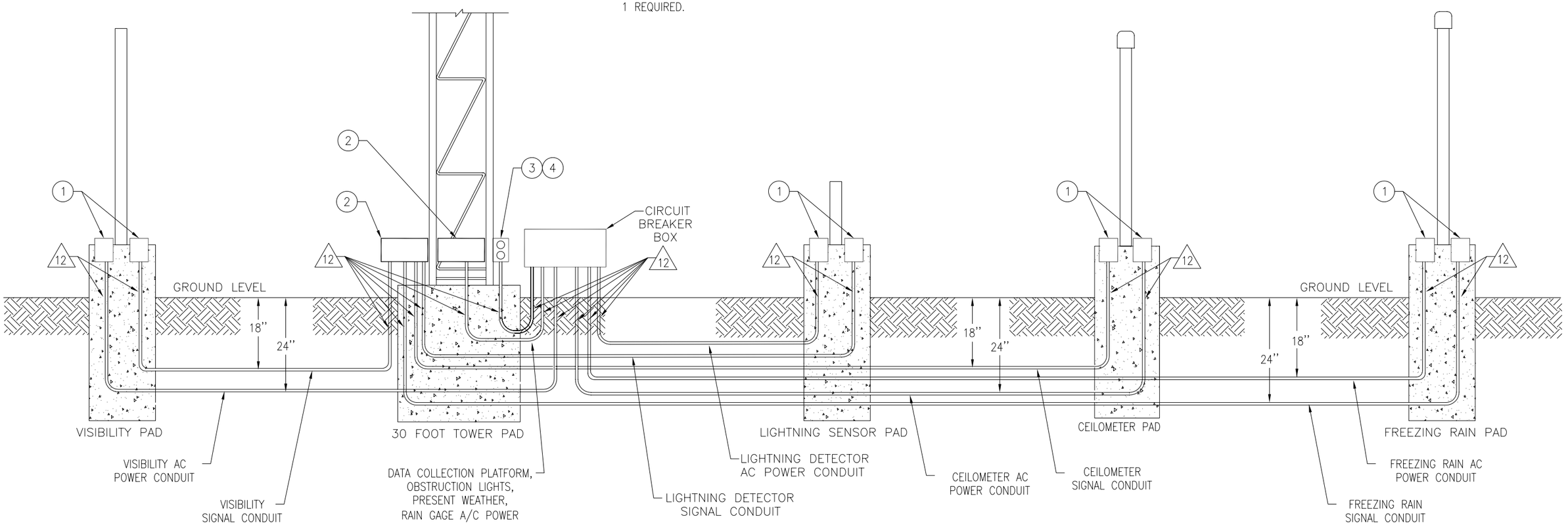
15. INSTALL 12 AWG THHN AC POWER WIRES OR EQUIVALENT FROM POWER DISTRIBUTION BOX TO AC POWER JUNCTION BOXES.

(1) CONDUIT OUTLET BODIES, 3/4" HOLES. APPLETON C75-M WITH COVER K75-CM AND RUBBER GASKET GK75-N OR EQUIVALENT. 8 REQUIRED.

(2) WEATHER TIGHT DEVICE BOX. FIVE 3/4" HOLES MIN. APPLETON WST275 AND COVER WCB24 OR EQUIVALENT. 2 REQUIRED.

(3) GFCI RECEPTACLE PLATE WITH GASKET AND COVER. HUBBELL WPFS26 OR EQUIV. AND GFCI DUPLEX RECEPTACLE, 15 AMP, 125V HUBBELL GF-5262 OR EQUIVALENT. 1 REQUIRED.

(4) WEATHER TIGHT DEVICE BOX, 3/4" HOLE. APPLETON FD-1-75 OR EQUIVALENT. 1 REQUIRED.



TOWER PAD, VISIBILITY SENSOR PAD, CEILOMETER PAD, LIGHTNING SENSOR PAD AND FREEZING RAIN SENSOR PAD ELECTRICAL CONDUIT

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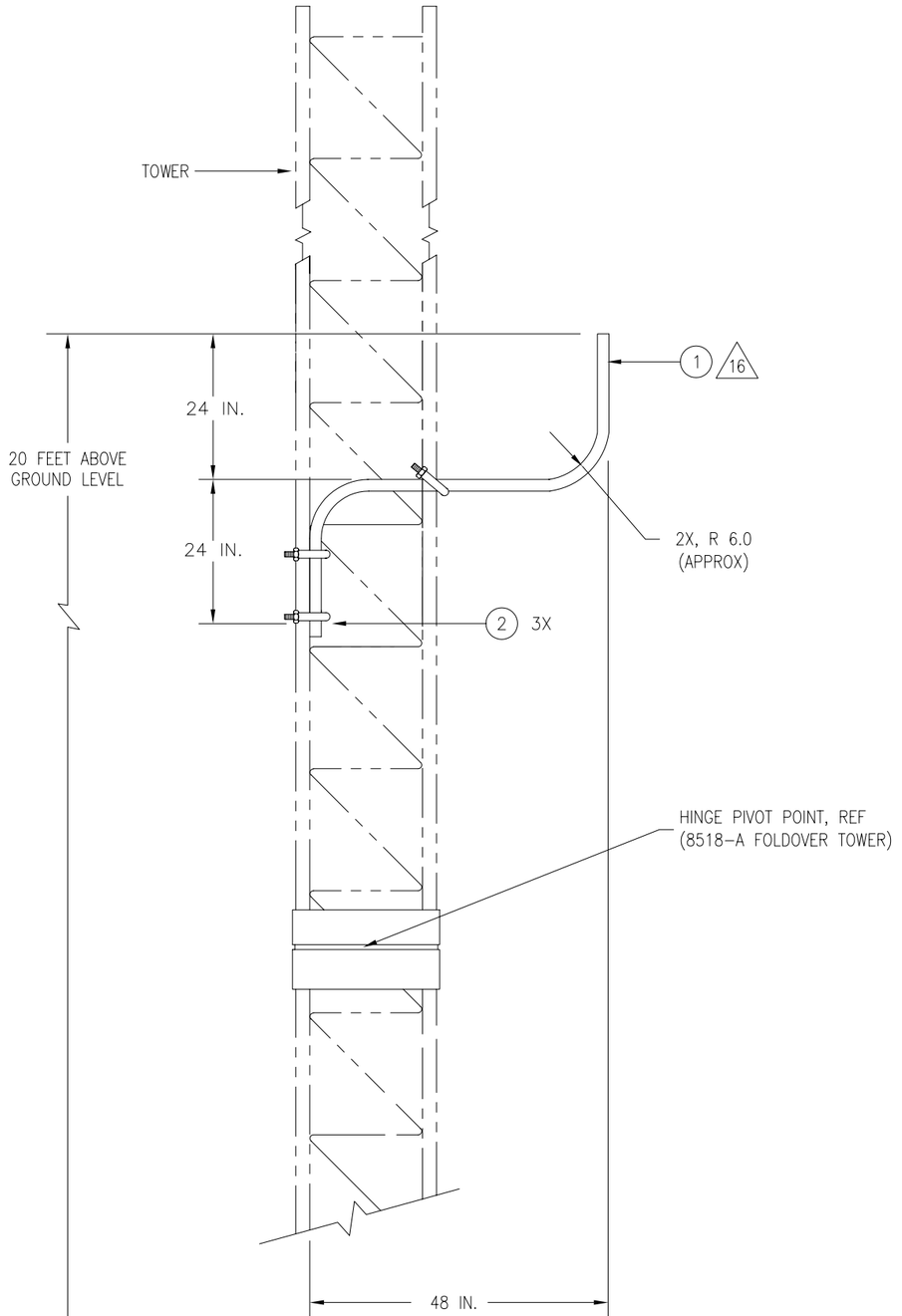
SIZE	DWG NO.	
D	3000-Z-007	
SCALE NONE	REV LTR A	SHEET 15 OF 17

NOTES: UNLESS OTHERWISE SPECIFIED;

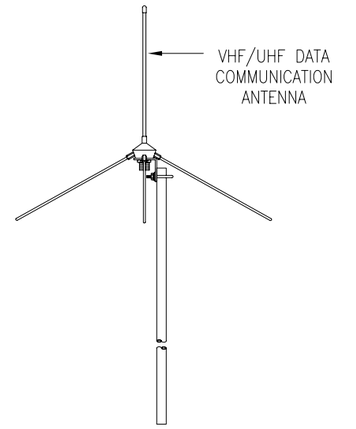
16 MOUNT ON THE SIDE OF THE TOWER NEAREST THE CENTRAL DATA PROCESSOR EQUIPMENT.

1 ø3/4" CONDUIT (RIGID OR EMT). 1 REQUIRED.

2 U-BOLT 1/4" X 1 1/2" I.D. X 2 3/4" L. GERWIN 309 OR EQUIVALENT. 3 REQUIRED.



RADIO DATA LINK ANTENNA MAST



VHF/UHF ANTENNA MOUNTING

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SIZE	DWG NO.	
D	3000-Z-007	
SCALE NONE	REV LTR A	SHEET 16 OF 17

Material List		
Quantity	Description	Part No. (or equiv.)
210'	3/4" rigid steel conduit (varies with location of power distribution box)	
2	3/4" X 10' long copper clad ground rods (one used as lightning rod on 8509 Tower)	
50'	#4/0 AWG copper grounding wire	
10 cu. yds min	3000 PSI concrete	
0.2 cu. yds min	1/2" to 1" crushed rock for drainage under tower, visibility, ceilometer, lightning sensor and freezing rain foundations	
25 sq. ft.	4X4 6/6 steel wire mesh (tower foundations)	
10'	2" galvanized steel pipe (8518-A Foldover Tower cradle)	
1	2-1/2" X 3' long galvanized steel pipe (lightning)	
1	2-1/2" X 4' long galvanized steel pipe (ceilometer)	
6	2-1/2" X 6' long galvanized steel pipe (visibility,freezing rain,4 sensor foudations)	
4	2-1/2" galvanized steel coupling (visibility,ceilometer,lightning,freezing rain)	
4	2-1/2" galvanized steel cap (visibility,ceilometer,lightning,freezing rain)	
1	46" Dia., 6' Long Ready-Form tube (8509 cylindrical foundation)	
1	48" Dia., 4' Long Ready-Form tube (8518-A Foldover Tower cylindrical foundation)	
1	12" Dia., 3'4" Long Ready-Form tube (8518-A Foldover Tower cradle)	
4	24" Dia., 5' Long Ready-Form tube (visibility,ceilometer,lightning,freezing rain)	
1	1-1/4" Dia. X 8' long PVC pipe (8509 cylindrical foundation)	
3	Conduit clamps for lightning rod (8509 Tower)	Appleton PC-100RA
1	Circuit breaker panel w/ 100A main breaker (if required), a 20A breaker and 8 (min.) 15A circuit breakers	
1	Main power disconnect box, if required by code	
as req.	Main power transformers	
as req.	Power cable, incoming	120' ea.
120' ea.	Power cable, intrasite	12AWG THHN, Black, White, Green
as req.	Signal cable from tower to CDP and from CDP to Remote Display (at sites designated as "landline" as opposed to UHF radio data link, 4000 ft. max.)	
25'	3/16" polypropylene pull rope	
8	Conduit outlet bodies, 2 holes, 3/4" (vis,ceilometer,lightning,freezing rain pwr & sig)	Appleton C75-M
8	Conduit outlet body covers	Appleton K75-M
8	Conduit outlet body rubber gaskets	Appleton GK75-N
2	Device box, 5 holes min., 3/4" (power & signal distribution)	Appleton WST275
2	Device box cover	Appleton WCB24
1	GFCI duplex receptacle, 15A, 125V (ac power outlet)	Hubbell GF-5262
1	GFCI duplex receptacle plate w/cover and gasket	Hubbell WPFS 26
20	Conduit straps (attach conduit to foundations)	Appleton CF-750
40	1/4" expanding masonry bolts for conduit straps	
3	U-Bolt, 1/4" X 1-1/2" I.D. X 2-3/4" long (antenna mast)	Gerwin 309

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This antenna is supplied to operate satisfactorily within the frequency range(s) specified on the carton label. Some models require cutting of radiator and/or radials in accordance with Figure 11. If the antenna is to be used over a range of frequencies, the element lengths should be chosen for mid-range or favor the element length for the most used, or the frequency requiring the greatest range.

ASSEMBLING THE ANTENNA

1) Select antenna location and route cable from set to antenna.

2) Loosen mounting nut and assemble radials to hub as shown in illustration. Tighten jam nuts and lockwashers against hub to secure the radials. Retighten mounting nut.

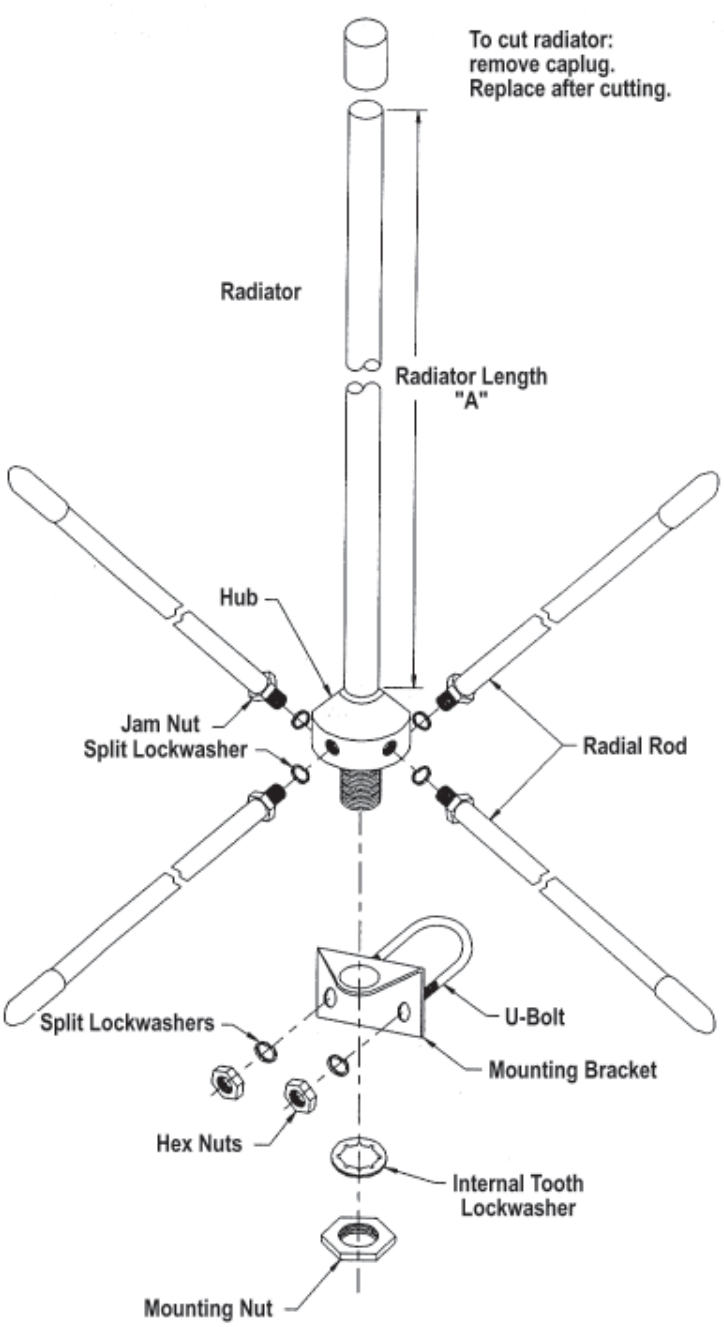
3) Connect cable to antenna (accepts PL-259).

Some models are supplied with cable and connector for the antenna end. Radio end connector is not supplied.

4) Mount antenna onto 1/2"-3/4" pipe, or up to 1-3/8" O.D. tubing (not supplied) with U-bolt, lockwashers and hex nuts provided.

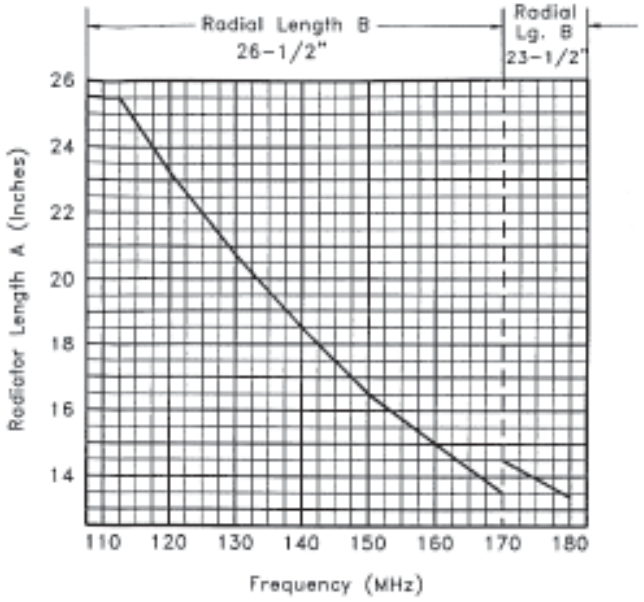
5) Secure cable to mounting pipe with straps or plastic tape to avoid strain on cable connections.

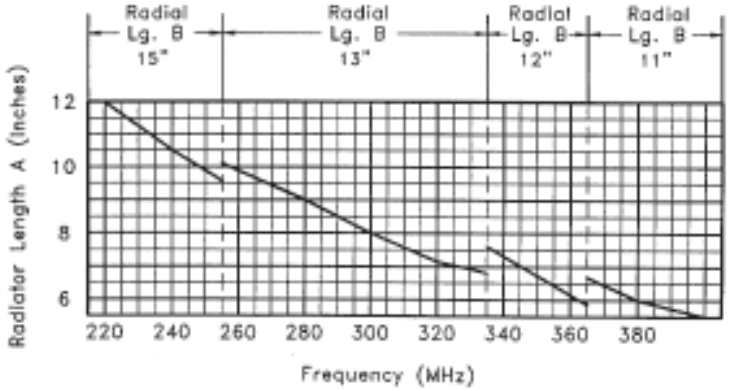
The use of a PTFE or similar lubricant on the threaded portions of the antenna prior to assembly will provide protection from weather and ease future disassembly.



UHF/VHF Antenna Assembly

Lengths on chart are approximate. For finer tuning, use a VSWR bridge if antenna is to be used for transmitting.

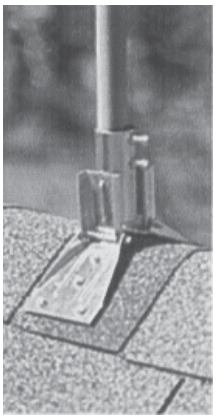




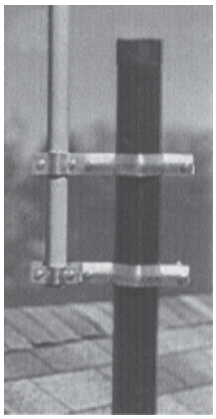
Remove vinyl cap before measuring and cutting. Slide vinyl cap back on after cutting.

TUNING ADJUSTMENT TABLE

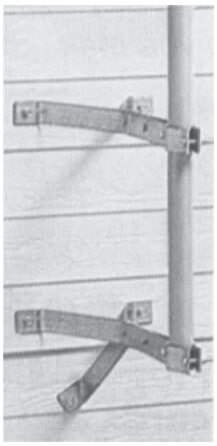
Frequency (MHz)	Radiator Length A (Inches)	Radial Length B (Inches)
406–420	5–5/8	10
450–470	5	8–1/2
470–488	4–15/16	7–3/4
488–512	4–5/8	7–3/4



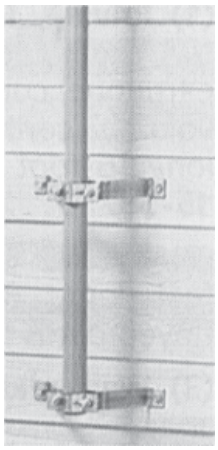
Base and Roof Mount.
Heavy-gauge steel swivel base fits the slope of most roofs. 1¼" mast locks into U-bolt.
Radio Shack P/N 15-889



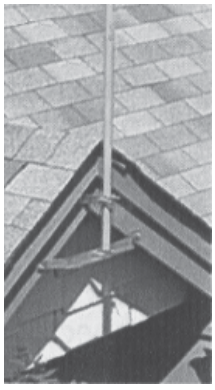
Vent Pipe Mount.
Brackets attach to 2" to 5" vent pipes (GC model fits 2" to 4" vents). 1¼" mast clamps into place.
Radio Shack P/N 15-893
GC Electronics P/N 8802



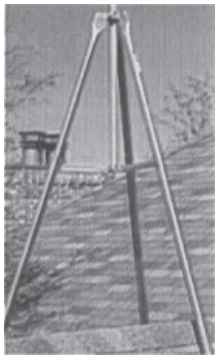
12" Wall Mounts.
Secures 1¼" mast 12" from side of building.
Radio Shack P/N 15-885
GC Electronics P/N 8312



4" Wall Mounts.
Secures 1¼" mast 4" from side of building.
Radio Shack P/N 15-883
GC Electronics P/N 8304



Eaves Mount.
Secures 1¼" mast to hanging rafters or trim boards; fits most medium-pitch roofs. Includes 4 lag bolts.
Radio Shack P/N 15-891



3' Tripod Mount.
Designed for larger antennas and areas subject to strong winds. Fits slope of most roofs. Fits 1¼" mast.
Radio Shack P/N 15-516
GC Electronics P/N 9160

Masts:
Use with 1¼" diameter 5' steel mast (Radio Shack P/N 15-842, GC Electronics P/N 32-9013) or 10' steel mast (Radio Shack P/N 15-843, GC Electronics P/N 32-9014).

Central Station Antenna Mast Options

All Weather Inc.
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Sacramento, CA 95818
Fax: 916.928.1165
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Toll Free: 800.824.5873

3000-Z-025
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